Phase Two Environmental Site Assessment

185 Preston Street, Ottawa, Ontario

Type of Document:
Final

Client:
Ms. Siffan Rahman
404-655 Beauparc Private
Ottawa, Ontario K1J 0B6

Project Number:
OTT-00257522-A0

Prepared By: Leah Wells, B.A.Sc., E.I.T.

Reviewed By: Patricia Stelmack, M.Sc., P.Eng.

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
Canada

Date Submitted:
January 14, 2020

Phase Two Environmental Site Assessment
185 Preston Street, Ottawa, Ontario

Type of Document:
Final

Client:
Ms. Siffan Rahman
404-655 Beauparc Private
Ottawa, Ontario K1J 0B6

Project Number:
OTT-00257522-A0

Prepared By:
EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
Canada
T: 613 688-1899
F: 613 225-7337
www.exp.com

Leah Wells, B.A.Sc., E.I.T.
Environmental Engineer-in-Training
Earth & Environmental

Patricia Stelmack, M. Sc., P.Eng.
Environmental Engineer
Earth & Environmental

Date Submitted:
January 14, 2020

Legal Notification

This report was prepared by EXP Services Inc. for the account of **Ms. Siffan Rahman**

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties unless a reliance letter has been addressed to, or otherwise provides reliance to, such third party. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Executive Summary

EXP Services Inc. (EXP) was retained by the Ms. Siffan Rahman to conduct a Phase Two Environmental Site Assessment (ESA) of the property located at 185 Preston Street in Ottawa, Ontario, hereinafter referred to as the "Phase Two property". The objective of the Phase Two ESA was to address areas of potential environmental concern (APEC) identified in a Phase One ESA conducted at the Phase Two property by EXP.

The Phase Two property is located on the west side of Preston Street, approximately 30 metres south of Poplar Street at 185 Preston Street. The Phase One property has an area of approximately 0.022 hectares and is roughly rectangular in shape. At the time of the investigation, the site was occupied by a two-storey residential building.

The findings of the Phase One ESA were presented in a report entitled *Phase One Environmental Site Assessment, 185 Preston Street, Ottawa, Ontario,* EXP Services Inc., dated December 19, 2019. The Phase One ESA identified the following Potentially Contaminating Activities (PCA) and Areas of Potential Environmental Concern (APEC):

Table EX.1 - Areas of Potential Environmental Concern and Potentially Contaminating Activity

Area of Potential Environmental Concern (APEC)	Location of APEC	Potentially Contaminating Activity (PCA)	Contaminants of Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
1. Former tannery located on the Phase Two property and debris material produced by a fire in 1900 that destroyed all the buildings within 250 metres of the Phase Two property	Entirety of Phase Two property	#30: Importation of Fill Material of Unknown Quality #53: Tannery	BTEX, PHCs, PAHs, Metals and inorganics	Soil

Based on the findings of the Phase One ESA, EXP recommended that a Phase Two ESA be conducted for soil analysis for the identified contaminants of concern. Should the contaminants of concern exceed the selected Site Condition Standards (SCS) established under subsection 169.4(1) of the *Environmental Protection Act*, and presented in the document entitled *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, Ontario Ministry of Environment, Conservation and Parks (MECP), 2011, it is recommended that groundwater analysis also be completed.

The Phase Two ESA consisted of advancing a total of two boreholes (BH1 and BH2) at the Phase Two property. Soil samples were collected and submitted for laboratory analysis of PHC, BTEX, PAH, and inorganics, as identified in the Phase One ESA.

For assessment purposes, EXP selected the 2011 Table 3 Site Condition Standards (SCS) in a non-potable groundwater condition for residential/parkland/institutional property use and coarse textured soil. Based on the Phase Two ESA results, the following summary is provided:

- Concrete was encountered at ground surface in BH1 and BH2 to a depth of 0.1 metres. Below the concrete in BH1, sand and gravel fill was encountered to a depth of 0.7 metres. This was followed

by a cobble and boulder fill to a depth of 1.5 metres. Below the concrete in BH2 (which was drilled inside the existing building), a clearstone layer was present to a depth of 0.3 metres. No odours or visual indications of impact were observed in the fill material.

- Below the fill in BH1 was a silty sand till present to a depth of 2.1 metres. Below the fill in BH2 was sand. BH2 was terminated in this layer at 4.3 metres. In BH1, the sand layer was present beneath the till and terminated at 6.7 metres. Glacial till was present below the sand layer in BH2. No odours or visual indications of impact were observed in the native material.
- Bedrock was not encountered during the soil investigation.
- Soil samples were submitted for laboratory analysis of BTEX, PHC, PAH, and metals. All of the soil samples were within the MECP Table 3 SCS for all parameters that were analysed.
- As no contaminants of concern were present on the Phase Two property in exceedance of the MECP Table 3 SCS, no groundwater samples were submitted for laboratory analysis.

Based on the results of the Phase Two ESA, no further environmental investigations are deemed to be warranted.

Table of Contents

List of Appendices

1 Introduction

EXP Services Inc. (EXP) was retained by the Ms. Siffan Rahman to conduct a Phase Two Environmental Site Assessment (ESA) of the property located at 185 Preston Street in Ottawa, Ontario, hereinafter referred to as the "Phase Two property". The objective of the Phase Two ESA was to address areas of potential environmental concern (APEC) identified in a Phase One ESA conducted at the Phase Two property by EXP.

The Phase Two property is currently occupied by a two-storey residential building. EXP understands that the intended future use of the property is for commercial/residential use. Since the proposed future use of the property is not more sensitive than its previous use a Record of Site Condition (RSC) is not required.

This report has been prepared in accordance with general requirements outlined in CSA Standard Z769-00 (2013) and in accordance with generally accepted professional practices. Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. Limitation of liability, scope of report and third-party reliance are outlined in Section 5 of this report.

1.1 Site Description

The Phase Two property is located on the west side of Preston Street, approximately 30 metres south of Poplar Street at 185 Preston Street. The Phase Two property has an area of approximately 0.022 hectares and is roughly rectangular in shape. At the time of the investigation, the site was occupied by a two-storey residential building. A Site Location Plan is provided as Figure 1 in Appendix A.

The Phase Two property is legally described as PLAN 62 PT LOT 4 PRESTON, City of Ottawa and property identification number (PIN) is 041080178. A survey plan is provided in Appendix B.

1.2 Current and Proposed Future Uses

At the time of the investigation, the Phase Two property was residential as defined by Ontario Regulation 153/04. The proposed future use for the Phase Two property is commercial/residential. Since the proposed future use of the property is not more sensitive than its previous use a Record of Site Condition (RSC) is not required.

1.3 Background

The Phase Two property is located in a mixed commercial and residential area. Potable water is available from the City of Ottawa, and there are no potable water wells nearby.

Topographically, the Phase Two property and surrounding areas are relatively flat. Based on local topography, it is anticipated that groundwater flows west to northwest. Regional groundwater flows direction is north towards the Ottawa River, a distance of 1 km.

In accordance with Section 41 of the Ontario Regulation 153/04 (as amended), the Phase Two property is not located in an environmentally sensitive area. In addition, the Phase Two property is not located within an area of natural significance and it does not include land that is within 30 metres of an area of natural significance.

Based on the Phase Two ESA investigation, the Phase Two property is not a shallow soil property as defined in Section 43.1 of Regulation 153/04. It does not include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

Beneath any fill, the surficial geology of the Phase Two property is characterized by sand and gravel glacial till. Bedrock in the general area of the Phase Two property consists of Ordovician aged limestone and shale of the Eastview Formation.

1.4 Past Investigations

The findings of the Phase One ESA were presented in a report entitled *Phase One Environmental Site Assessment, 185 Preston Street, Ottawa, Ontario,* EXP Services Inc., dated December 19, 2019. The Phase One ESA identified the following Potentially Contaminating Activities (PCA) and Areas of Potential Environmental Concern (APEC):

Table 1.1 - Areas of Potential Environmental Concern and Potentially Contaminating Activity

Area of Potential Environmental Concern (APEC)	Location of APEC	Potentially Contaminating Activity (PCA)	Contaminants of Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
1. Former tannery located on the Phase Two property and debris material produced by a fire in 1900 that destroyed all the buildings within 250 metres of the Phase Two property	Entirety of Phase Two property	#30: Importation of Fill Material of Unknown Quality #53: Tannery	BTEX, PHCs, PAHs, Metals and inorganics	Soil

Based on the findings of the Phase One ESA, EXP recommended that a Phase Two ESA be conducted for soil analysis for the identified contaminants of concern. Should the contaminants of concern exceed the selected Site Condition Standards (SCS) established under subsection 169.4(1) of the *Environmental Protection Act*, and presented in the document entitled *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, Ontario Ministry of Environment, Conservation and Parks (MECP), 2011, it is recommended that groundwater analysis also be completed.

The Phase One ESA was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices.

1.5 Regulatory Framework

Analytical results were compared to Site Condition Standards (SCS) established under subsection 169.4(1) of the Environmental Protection Act, and presented in the document entitled *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, (MOE, 2011). This document provides tabulated background SCS (Table 1) applicable to environmentally sensitive sites and effects-based generic SCS (Tables 2 to 9) applicable to non-environmentally sensitive sites. The effects-based SCS (Tables 2 to 9) are protective of human health and the environment for different groundwater conditions (potable and non-potable), land use scenarios (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil texture (coarse or medium/fine) and restoration depth (full or stratified).

Table 1 to 9 SCS are summarized as follows:

- Table 1 – applicable to sites where background concentrations must be met (full depth), such as sensitive sites where site-specific criteria have not been derived
- Table 2 – applicable to sites with potable groundwater and full depth restoration
- Table 3 – applicable to sites with non-potable groundwater and full depth restoration
- Table 4 – applicable to sites with potable groundwater and stratified restoration
- Table 5 – applicable to sites with non-potable groundwater and stratified restoration
- Table 6 – applicable to sites with potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 7 – applicable to sites with non-potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 8 – applicable to sites with potable groundwater and that are within 30 m of a water body
- Table 9 – applicable to sites with non-potable groundwater and that are within 30 m of a water body

Application of the generic or background SCS to a specific site is based on a consideration of site conditions related to soil pH, thickness and extent of overburden material, and proximity to an area of environmental sensitivity or of natural significance. For some chemical parameters, consideration is also given to soil textural classification with SCS having been derived for both coarse and medium-fine textured soil conditions.

For assessment purposes, EXP selected the 2011 Table 3 SCS in a non-potable groundwater condition for residential/parkland/institutional property use and coarse textured soil. The selection of this category was based on the following factors:

- Laboratory analysis determined the soil to be coarse textured;
- Bedrock is greater than 2 metres below grade across the subject property;
- There are no surface water bodies within 30 metres of the subject property;
- The soil at the Phase Two property has a pH value between 5 and 9 for surficial soils and between 5 and 11 for subsurface soils, as confirmed during the current investigation;
- The Phase Two property is not located within an area of natural significance, does not include nor is adjacent to an area of natural significance, and does not include land that is within 30 metres of an area of natural significance;
- Potable water for the Phase Two property is provided by the City of Ottawa through its water distribution system;
- The Phase Two property is not located in an area designated in a municipal official plan as a well-head protection area;
- The Phase Two property is planned for residential use; and
- It is the opinion of the Qualified Person who oversaw this work that the Phase Two property is not a sensitive site.

2 Investigation Methodology

2.1 Borehole Drilling and Monitoring Well Installation

The Phase Two property investigative activities consisted of the drilling of boreholes to facilitate the collection of soil samples for chemical analysis and the installation of a monitoring well for the collection of groundwater samples for chemical analysis, should the latter be deemed to be warranted.

Prior to the commencement of drilling, the locations of underground public utilities including telephone, natural gas and electrical lines were marked at the Phase Two property by locating companies. A private utility locating contractor was also retained to clear the individual borehole locations.

On December 18, 2019 two boreholes (BH1 and BH2) were advanced at the Phase Two property by CCC Geotechnical & Environmental Drilling Ltd. (CCC), a licensed well contractor, under the full-time supervision of EXP staff. Soil samples for geologic characterization were collected on a continuous basis in the overburden materials using and a potable type drill equipped and split spoon sampler. A monitoring well was installed in BH1 to facilitate groundwater sampling, if required. The locations of the borehole and monitoring well are presented on Figure 2 in Appendix A.

No petroleum-based greases or solvents were used during drilling activities. EXP staff continuously monitored the drilling activities and recorded the depth of soil sample collection and total depth of boring. Field observations are summarized on the borehole logs provided in Appendix C.

The monitoring well consisted of a 32 millimetre diameter Schedule 40 PVC screen that was 3.0 m long and a Schedule 40 PVC riser pipe. The annular space around the monitoring wells was backfilled with sand to a height of approximately 0.3 m above the top of the screen. A bentonite seal was added from the top of the sand pack to approximately 0.3 m below ground surface. The monitoring well was protected with a monument casing. Details of the installation are shown on the borehole logs provided in Appendix C.

2.2 Soil Sampling

Soil samples identified for laboratory analysis were collected from the spoon samplers and placed directly into pre-cleaned, laboratory-supplied glass sample jars and vials. Geologic details of the recovered cores were logged by EXP field staff. EXP staff continuously monitored the drilling activities to log the stratigraphy observed from the recovered soil cores, to record the depth of soil sample collection, to record total depths of borings, and to record visual or olfactory observations of potential impacts. Field observations are summarized on the borehole logs provided in Appendix C.

Samples to be analysed for PHC fraction F1 and BTEX were collected using a soil core sampler and placed in to vials containing methanol as a preservative. The jars and vials were sealed with Teflon-lined lids to minimize head-space and reduce the potential for induced volatilization during storage/transport prior to analysis. All soil samples were placed in clean coolers containing ice prior to and during transportation to the subcontract laboratory, Bureau Veritas (BV) of Ottawa, Ontario. The samples were transported/submitted within 24 hours of collection to the laboratory following chain of custody protocols for chemical analysis.

2.3 Field Screening Measurements

The remaining portion of each soil sample was placed in a sealed Ziploc plastic bag and allowed to reach ambient temperature prior to field screening with a combustible vapour meter calibrated to hexane gas prior to use. The field screening measurements were made by inserting the instrument’s probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These ‘headspace’ readings provide a real-time indication of the relative concentration of combustible vapours encountered in the

subsurface during drilling and are used to aid in the assessment of the vertical and horizontal extent of potential impacts and the selection of soil samples for analysis.

Readings of petroleum vapour concentrations in the soil samples collected during the drilling investigation were recorded using an RKI Eagle 2, where there was sufficient recovery. This instrument is designed to detect and measure concentrations of combustible gas in the atmosphere to within 5 parts per million by volume (ppmv) from 0 ppmv to 200 ppmv, 10 ppmv increments from 200 ppmv to 1,000 ppmv, 50 ppmv increments from 1,000 ppmv to 10,000 ppmv, and 250 ppmv increments above 10,000 ppmv. It is equipped with two ranges of measurement, reading concentrations in ppmv or in percentage lower explosive limit (% LEL). The RKI Eagle 2 instrument can determine combustible vapour concentrations in the range equivalent to 0 to 11,000 ppmv of hexane.

The instrument was configured to eliminate any response from methane for all sampling conducted at the subject property. Instrument calibration is checked on a daily basis in both the ppmv range and % LEL range using standard gases comprised of known concentrations of hexane (400 ppmv, 40% LEL) in air. If the instrument readings are within ±10% of the standard gas value, then the instrument is deemed to be calibrated, however if the readings are greater than ±10% of the standard gas value then the instrument is re-calibrated prior to use.

The field screening measurements, in parts per million by volume (ppmv), are presented in the borehole logs provided in Appendix C.

Soil samples were selected for laboratory analysis based on combustible vapour measurements and visual and olfactory evidence of impacts, where observed. Two soil samples – one representative of fill material and one representative of native soil – and one field duplicate were collected from BH1 and BH2 and were submitted for laboratory analysis of petroleum hydrocarbon fractions (PHC) F1 to F4, benzene, toluene, ethylbenzene, xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), and inorganic parameters. Two of the samples submitted were also analysed for pH. One additional soil sample was submitted for grain size analysis.

2.4 Groundwater Sampling

As no contaminants of concern were present on the Phase Two property in excess of the MECP Table 3 SCS, no groundwater samples were submitted for laboratory analysis.

2.5 Quality Assurance and Quality Control Measures

All soil and groundwater samples were placed in coolers containing ice packs prior to and during transportation to the laboratory, Bureau Veritas (BV). BV is accredited to the ISO/IEC 17025:2005 standard - *General Requirements for the Competence of Testing and Calibration Laboratories*.

A QA/QC program was also implemented to ensure that the analytical results received are accurate and dependable. A QA/QC program is a system of documented checks that validate the reliability of the data. Quality Assurance is a system that ensures that quality control procedures are correctly performed and documented. Quality Control refers to the established procedures observed both in the field and in the laboratory, designed to ensure that the resulting end data meet intended quality objectives. The QA/QC program implemented by EXP incorporated the following components:

- Collecting and analysing a blind duplicate soil sample to ensure analytical precision
- Using dedicated and/or disposable sampling equipment
- Following proper decontamination protocols to minimize cross-contamination
- Maintaining field notes and completing field forms to document field activities

- Using only laboratory-supplied sample containers and following prescribed sample protocols, including using proper preservation techniques, meeting sample hold times, and documenting sample transmission on chains of custody, to ensure the integrity of the samples is maintained

BV's QA/QC program involved the systematic analysis of control standards for the purpose of optimizing the measuring system as well as establishing system precision and accuracy and included calibration standards, method blanks, reference standards, spiked samples, surrogates and duplicates.

3 Results

3.1 Geology

The detailed soil profiles encountered in the borehole are provided on the borehole logs in Appendix C. Boundaries of soils indicated on the logs are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change

The terrain at the Phase Two property consisted of approximately 0.1 metres of concrete in both boreholes. Approximately 0.6 metres of sand and gravel fill was present beneath the concrete layer in BH1. This was followed by a cobble and boulder fill to a depth of 1.5 metres. Below the concrete in BH2 (which was drilled inside the existing building), a clearstone layer was present to a depth of 0.3 metres. No odours or visual indications of impact were observed in the fill material.

Below the fill in BH1 was a silty sand till present to a depth of 2.1 metres. Below the fill in BH2 was sand. BH 2 was terminated in this layer at 4.3 metres. In BH1, the sand layer was present beneath the till and terminated at 6.7 metres. Glacial till was present below the sand layer in BH2. No odours or visual indications of impact were observed in the native material.

Bedrock was not encountered in any of the boreholes drilled at the Phase Two property, however based on geological maps of the area, it is present at approximately 7 to 8 metres below ground surface. Bedrock in the general area of the Phase Two property consists of Ordovician aged limestone and shale of the Eastview Formation.

3.2 Soil Quality

Chemical analyses were performed on selected soil samples recovered from the boreholes. The selection of “worst case” soil samples within each stratum from each borehole was based on field visual or olfactory evidence of impacts and/or presence of potential water bearing zones. The data are tabulated in Appendix D and the Certificates of Analysis are provided in Appendix E.

The MECP Table 3 SCS are applicable if soil pH is in the range of 5 to 9 for surficial soil (less than 1.5 m below soil surface) and 5 to 11 for subsurface soil (greater than 1.5 m below soil surface). The Certificates of Analysis include two pH measurements. One sample was collected at a depth less than 1.5 mbgs, and one sample was taken at a depth greater than 1.5 mbgs. The pH result of the surficial sample, 7.98, and the subsurface sample, 7.90, were both within the acceptable ranges.

3.2.1 Petroleum Hydrocarbons

Four soil samples and one field duplicate were submitted for chemical analysis of PHC and BTEX. All of the soil samples were within the MECP Table 3 SCS.

The PHC and BTEX results are provided in Table 1 in Appendix D.

3.2.2 Polycyclic Aromatic Compounds

Four soil samples and one field duplicate were submitted for chemical analysis of PAH. All of the soil samples were within the MECP Table 3 SCS.

The PAH results are provided in Table 2 in Appendix D.

3.2.3 Metals

Four soil samples and one field duplicate were submitted for chemical analysis of metals. All of the soil samples were within the MECP Table 3 SCS.

The metals results are provided in Table 3 in Appendix D.

3.3 Quality Assurance and Quality Control Results

Quality assurance and quality control measures were taken during the field activities to meet the objectives of the sampling and quality assurance plan to collect unbiased and representative samples to characterize existing conditions in the fill/upper overburden materials and groundwater at the Phase Two property. QA/QC measures, as described in Section 4.13, included:

- Collecting and analysing a blind duplicate soil samples to ensure analytical precision
- Using dedicated and/or disposable sampling equipment
- Following proper decontamination protocols to minimize cross-contamination
- Maintaining field notes and completing field forms to document field activities
- Using only laboratory-supplied sample containers and following prescribed sample protocols, including using proper preservation techniques, meeting sample hold times, and documenting sample transmission on chains of custody, to ensure the integrity of the samples is maintained

Duplicate soil sample pairs BH1-SS3 (DUP) were submitted for chemical analysis of PHC, BTEX, PAH, and metals. For QA/QC purposes, the analytical sample results are quantitatively evaluated by calculating the relative percent difference (RPD) between the samples and their duplicates. Since laboratory duplicates are a measure of laboratory precision, while field duplicates are a measure of both field and laboratory precision, the RPD alert limits for field duplicates were determined to be twice the limits for laboratory duplicates. The RPD are provided in Tables 4 to 6 in Appendix D. All of the RPD were either within the alert limits or not calculable, except for cobalt. The discrepancy is likely due to non-homogeneity of the glacial till material. However, since both the sample and the field duplicate were within the applicable MECP Table 3 SCS for all parameters that were analysed, the deviation should have no material effect on the interpretation of results.

The analytical program conducted by BV included analytical test group specific QA/QC measures to evaluate the accuracy and precision of the analytical results and the efficiency of analyte recovery during solute extraction procedures. The BV laboratory QA/QC program consisted of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificate of Analysis prepared by BV. The QA/QC results are reported as percent recoveries for matrix spikes, spike blanks and QC standards, relative percent difference for laboratory duplicates and analyte concentrations for method blanks.

Certificates of Analysis were received from BV reporting the results of all the chemical analyses performed on the submitted soil samples. Copies of the BV Certificates of Analysis are provided in Appendix E. A review of the Certificates of Analysis prepared by BV indicates that the matrix spike recovery for free cyanide (72%) was below the acceptance criteria (75 to 125%), which may indicate a low bias of the free cyanide results for samples within the batch. However, since all soil samples were non-detectable and the detection limit was more than five times less than the SCS, the deviation should have no material effect on the interpretation of the results. Further, all other laboratory QC samples were in compliance with the requirements set out under subsection 47(3) of Ontario Regulation 153/04 (as amended). Therefore, the analytical results reported by BV are of acceptable quality and additional data qualifications are not required.

4 Conclusions

For assessment purposes, EXP selected the 2011 Table 3 Site Condition Standards (SCS) in a non-potable groundwater condition for residential/parkland/institutional property use and coarse textured soil. Based on the Phase Two ESA results, the following summary is provided:

- Concrete was encountered at ground surface in BH1 and BH2 to a depth of 0.1 metres. Below the concrete in BH1, sand and gravel fill was encountered to a depth of 0.7 metres. This was followed by a cobble and boulder fill to a depth of 1.5 metres. Below the concrete in BH2 (which was drilled inside the existing building), a clearstone layer was present to a depth of 0.3 metres. No odours or visual indications of impact were observed in the fill material.
- Below the fill in BH1 was a silty sand till present to a depth of 2.1 metres. Below the fill in BH2 was sand. BH2 was terminated in this layer at 4.3 metres. In BH1, the sand layer was present beneath the till and terminated at 6.7 metres. Glacial till was present below the sand layer in BH2. No odours or visual indications of impact were observed in the native material.
- Bedrock was not encountered during the soil investigation.
- Soil samples were submitted for laboratory analysis of BTEX, PHC, PAH, and metals. All of the soil samples were within the MECP Table 3 SCS for all parameters that were analysed.
- As no contaminants of concern were present on the Phase Two property in exceedance of the MECP Table 3 SCS, no groundwater samples were submitted for laboratory analysis.

Based on the results of the Phase Two ESA, no further environmental investigations are deemed to be warranted.

5 Limitation of Liability, Scope of Report, and Third Party Reliance

Basis of Report

This report ("Report") is based on site conditions known or inferred by the investigation undertaken as of the date of the Report. Should changes occur which potentially impact the condition of the site the recommendations of EXP may require re-evaluation. Where special concerns exist, or Siffan Rahman ("the Client") has special considerations or requirements, these should be disclosed to EXP to allow for additional or special investigations to be undertaken not otherwise within the scope of investigation conducted for the purpose of the Report.

Reliance on Information Provided

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to EXP by the Client and others. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by the Client. EXP has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to exp. If new information about the environmental conditions at the Site is found, the information should be provided to EXP so that it can be reviewed and revisions to the conclusions and/or recommendations can be made, if warranted.

Standard of Care

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

Complete Report

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to EXP by the Client, communications between EXP and the Client, other reports, proposals or documents prepared by EXP for the Client in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. EXP is not responsible for use by any party of portions of the Report.

Use of Report

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the written consent of EXP. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. EXP is not responsible for damages suffered by any third party resulting from unauthorized use of the Report.

Report Format

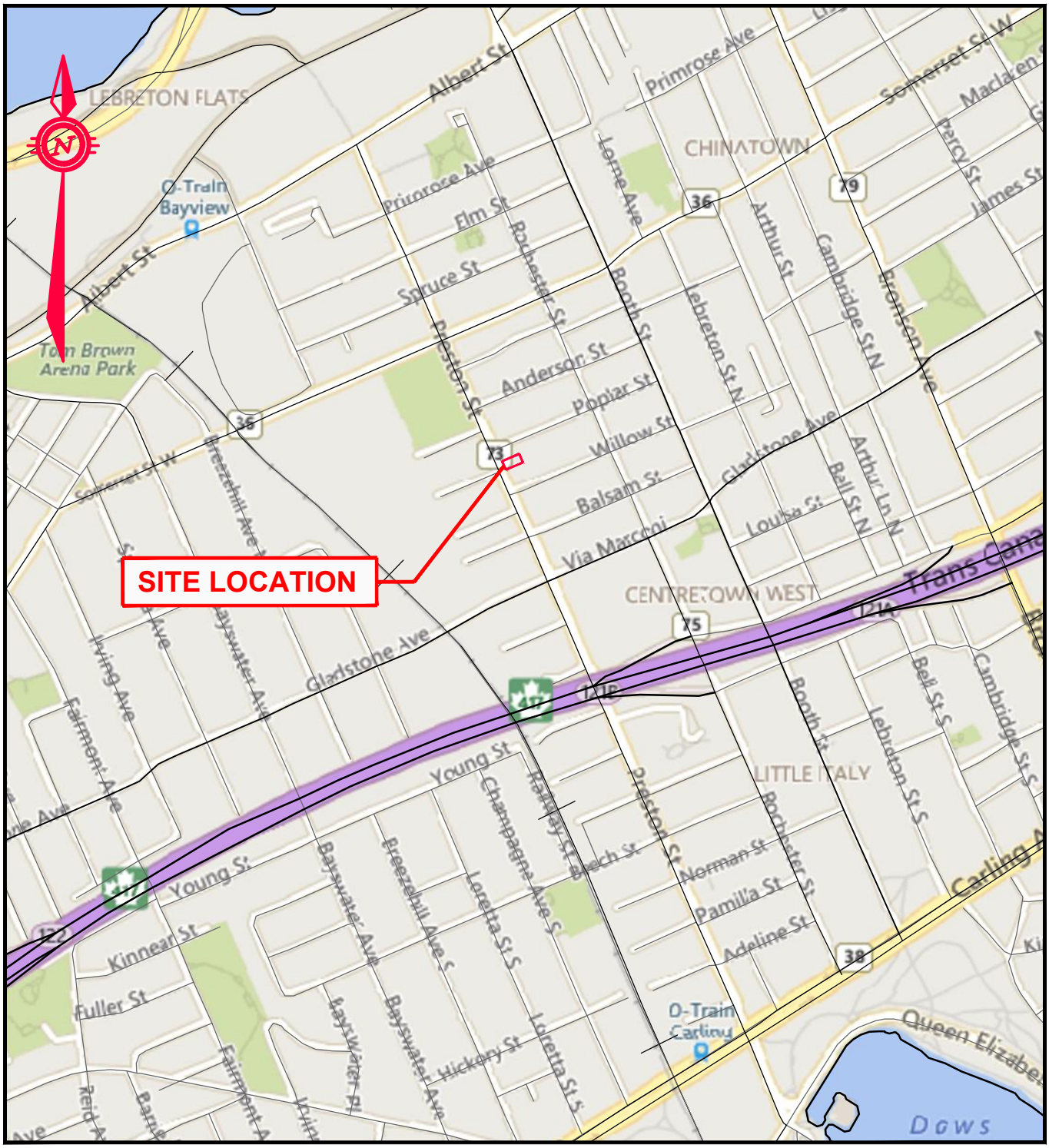
Where EXP has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by EXP utilize specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems. Regardless of format, the documents described herein are EXP's instruments of professional service and shall not be altered without the written consent of EXP.

6 References

This study was conducted in general accordance with the applicable Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Ministry of the Environment. Specific reference is made to the following:

- Canadian Standards Association, *CSA-Z769-00 (R2013), Phase II Environmental Assessment Standard*, 2013.
- EXP Services Inc., *Phase One Environmental Site Assessment, 185 Preston Street, Ottawa, Ontario*, December 19, 2019
- Ontario Ministry of the Environment, Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, December 1996
- Ontario Ministry of the Environment, *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, April 15, 2011
- Ontario Ministry of the Environment, *Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04,* June 2011.
- Ontario Ministry of the Environment, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* July 1, 2011.
- Ontario Regulation 153/04, made under the Environmental Protection Act, as amended
- Ontario Regulation 903/90, made under the Water Resources Act, as amended

Appendix A: Figures



0 100m 200m 400m

HORIZONTAL 1:10,000

EXP Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE: DEC. 2020	PROJECT: PROPOSED MULTI-USE DEVELOPMENT 185 PRESTON STREET, OTTAWA, ON	project no.: OTT-00257522-A0
DESIGN: S.P. / CHECKED: S.P.		scale: 1:10,000
DRAWN BY: G.C.	TITLE: SITE LOCATION PLAN	FIG 1

Filename: e:\ott\ott-00257522-a0\60 execution\65 drawings_geo\185 present-site location plan.dwg
Last Saved: 1/8/2020 2:47:31 PM
Last Plotted:1/8/2020 2:52:12 PM Plotted by: CuiG Pen Table:: exp-64.ctb

BACKGROUND MAP DATA FROM CITY OF OTTAWA © 2019, TERANET ENTERPRISES

0 5m 10m 20m

HORIZONTAL 1:500

NOTES:
1. THE BOUNDARIES AND SOIL TYPES HAVE BEEN ESTABLISHED ONLY AT BOREHOLE LOCATIONS. BETWEEN BOREHOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. SOIL SAMPLES WILL BE RETAINED IN STORAGE FOR THREE MONTHS AND THEN DESTROYED UNLESS THE CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. BOREHOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING(S) OR FLOOR SLABS OR PARKING LOT(S) GRADES.
4. THIS DRAWING FORMS PART OF THE REPORT PROJECT NUMBER AS REFERENCED AND SHOULD BE USED ONLY IN CONJUNCTION WITH THIS REPORT.

LEGEND

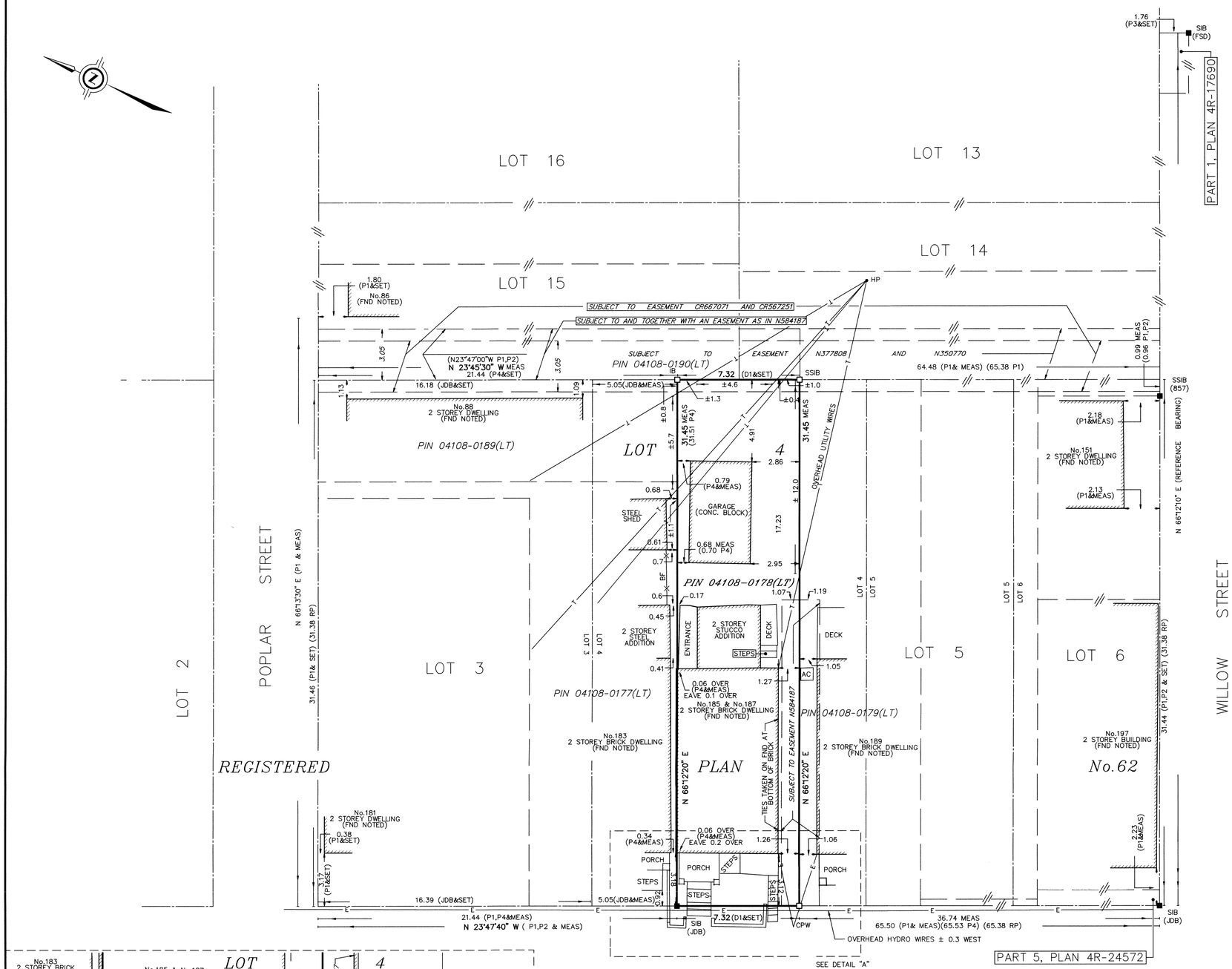
BH1	BOREHOLE NUMBER AND LOCATION
BH2	MONITORING WELL NUMBER AND LOCATION

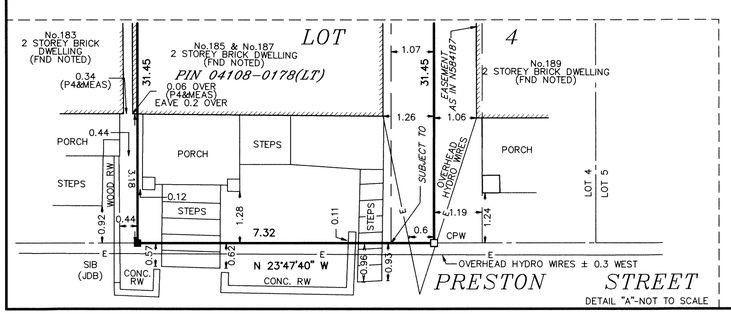
EXP Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE: JAN. 2020	PROJECT: PROPOSED MULTI-USE DEVELOPMENT 185 PRESTON STREET, OTTAWA, ON		project no. OTT-00257522-A0
DESIGN: S.P.	CHECKED: S.P.		scale: 1:500
DRAWN BY: G.C.	TITLE: SITE LOCATION PLAN		FIG 1

Filename: e:\ott\ott-00257522-a0\60 execution\65 drawings_geotl\185 present-site location plan.dwg
Last Saved: 1/8/2020 2:47:31 PM
Last Plotted: 1/8/2020 3:24:59 PM Plotted by: CuiG Pen Table:: exp-64.ctb

Appendix B: Survey Plan





SURVEYOR'S REAL PROPERTY REPORT
PART 1 - PLAN SHOWING

PART OF LOT 4
REGISTERED PLAN No.62
CITY OF OTTAWA

SCALE 1 : 150

2.5 0 2.5 5 10 metres

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

PART 2 - SURVEY REPORT

- DESCRIPTION
PART OF LOT 4, REGISTERED PLAN No.62, BEING PIN 04108-0178(LT), IN THE CITY OF OTTAWA.

- REGISTERED EASEMENTS AND/OR RIGHTS-OF-WAY
SUBJECT TO AND TOGETHER WITH AN EASEMENT AS IN N584187.
SUBJECT TO EASEMENTS AS IN CR567251 AND CR667071.

- BOUNDARY FEATURES

NOTE THE LOCATOIN OF THE OVERHEAD UTILITY WIRES AT EASTERLY AND WESTERLY LIMIT OF THE SUBJECT PARCEL.

NOTE THE LOCATION OF THE SUBJECT BUILDING No.185 AT NORTHERLY LIMIT OF SUBJECT PARCEL.

NOTE THE LOCATION OF THE STEPS AND RETAINING WALL AT THE WESTERLY LIMIT OF SUBJECT PARCEL.

NOTES

BEARINGS ARE GRID AND ARE DERIVED FROM THE NORTHERLY LIMIT OF WILLOW STREET AS SHOWN ON PLAN 4R-24572, HAVING A BEARING OF N 66°12'10" E.

COMPLIANCE WITH ONTARIO BUILDING CODE SETBACK REQUIREMENTS ARE NOT VERIFIED BY THIS SURVEY.

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
CPW	DENOTES	CONCRETE PIN AND WASHER
MEAS	DENOTES	MEASURED
RP	DENOTES	REGISTERED PLAN No.62
P1	DENOTES	SRPR BY FAIHALL MOFFATT WOODLAND LIMITED, DATED APRIL 12, 2007.
P2	DENOTES	PLAN 4R-24572
P3	DENOTES	PLAN 4R-17690
P4	DENOTES	PLAN OF SURVEY BY J. D. BARNES LIMITED, DATED AUGUST 10, 1976.
D1	DENOTES	INST. N584187
BF	DENOTES	BOARD FENCE
RW	DENOTES	RETAINING WALL
HP	DENOTES	HYDRO POLE
FND	DENOTES	FOUNDATION
(857)	DENOTES	FAIRHALL MOFFATT & WOODLAND LIMITED
(JDB)	DENOTES	J.D. BARNES LIMITED
(FSD)	DENOTES	FARLEY, SMITH & DENIS SURVEYING LTD.

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON APRIL 19, 2016.

APRIL 20, 2016
DATE

GEORGE ZERVOS
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
1967660

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

PREPARED FOR: 9523898 CANADA Inc.

J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
2430 DON REID DRIVE, SUITE 204, OTTAWA, ON K1H 1E1
T: (613) 731-7244 F: (613) 731-8955 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
QC	GZ	16-10-015-00
FILE: G:\16-10-015\00\015-SRPR.dgn		DATED: MAR/23/16

PLOTTED: 20/04/2016

Appendix C: Borehole Logs

Explanation of Terms Used on Borehole Records

SOIL DESCRIPTION

Terminology describing common soil genesis:

Topsoil: mixture of soil and humus capable of supporting good vegetative growth.

Peat: fibrous fragments of visible and invisible decayed organic matter.

Fill: where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc.; none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

Till: the term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Terminology describing soil structure:

Desiccated: having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.

Stratified: alternating layers of varying material or color with the layers greater than 6 mm thick.

Laminated: alternating layers of varying material or color with the layers less than 6 mm thick.

Fissured: material breaks along plane of fracture.

Varved: composed of regular alternating layers of silt and clay.

Slickensided: fracture planes appear polished or glossy, sometimes striated.

Blocky: cohesive soil that can be broken down into small angular lumps which resist further breakdown.

Lensed: inclusion of small pockets of different soil, such as small lenses of sand scattered through a mass of clay; not thickness.

Seam: a thin, confined layer of soil having different particle size, texture, or color from materials above and below.

Homogeneous: same color and appearance throughout.

Well Graded: having wide range in grain sized and substantial amounts of all predominantly on grain size.

Uniformly Graded: predominantly on grain size.

All soil sample descriptions included in this report follow the ASTM D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). The system divides soils into three major categories: (1) coarse grained, (2) fine-grained, and (3) highly organic. The soil is then subdivided based on either gradation or plasticity characteristics. The system provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification. The classification excludes particles larger than 76 mm. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually in accordance with ASTM D2488-09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems. Others may use different classification systems; one such system is the ISSMFE Soil Classification.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		

0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	200

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present and as described below in accordance with Note 16 in ASTM D2488-09a:

Table a: Percent or Proportion of Soil, Pp

	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5≤Pp≤10%
Little	15≤Pp≤25%
Some	30≤Pp≤45%
Mostly	50≤Pp≤100%

The standard terminology to describe cohesionless soils includes the compactness as determined by the Standard Penetration Test 'N' value:

Table b: Apparent Density of Cohesionless Soil

	'N' Value (blows/0.3 m)
Very Loose	N<5
Loose	5≤N<10
Compact	10≤N<30
Dense	30≤N<50
Very Dense	50≤N

The standard terminology to describe cohesive soils includes consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests or similar field and laboratory analysis, Standard Penetration Test 'N' values can also be used to provide an approximate indication of the consistency and shear strength of fine grained, cohesive soils:

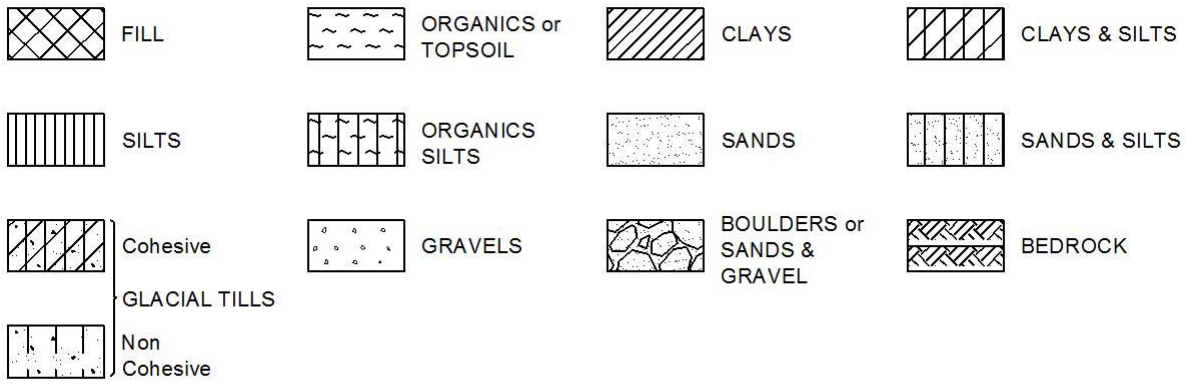
Table c: Consistency of Cohesive Soil

Consistency	Vane Shear Measurement (kPa)	'N' Value
Very Soft	<12.5	<2
Soft	12.5-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

Note: 'N' Value - The Standard Penetration Test records the number of blows of a 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler 1 foot (305mm). For split spoon samples where full penetration is not achieved, the number of blows is reported over the sampler penetration in meters (e.g. 50/0.15).

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:



WATER LEVEL MEASUREMENT

Log of Borehole BH-1

Project No: OTT-00257522-A0

Project: Proposed Multi-Use Development

Location: 185 Preston Street, Ottawa, Ontario

Figure No. B-1

Page. 1 of 1

Date Drilled: 'December 18, 2019

Drill Type: Portable Drill

Datum: Depth Below Grade

Logged by: M.L. Checked by: S.P.

Split Spoon Sample ⊠
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits —○—
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Depth Below Grade m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		CONCRETE ~100mm With 20 mm diameter steel reinforcing bar	0 -0.1	0	4	0	SS1	
		GRANULAR FILL (BASE) Silty sand with gravel, brown, moist, (loose)	-0.7		50 for 75 mm	0	SS2	
		FILL Cobbles and boulders		1			Run 1	
		GLACIAL TILL Silty sand with gravel, grey, wet, (compact)	-1.5		15	5	SS3	
		SILTY SAND Brown, moist to wet, (loose to compact)	-2.1	2	23	5	SS4	
				3	10	0	SS5	
					10	0	SS6	
				4	10	0	SS7	
				5	7	0	SS8	
					8	0	SS9	
		Dynamic Cone Penetration Test (DCPT) conducted from 5.8 m depth to cone refusal at 8.4 m depth.	-5.8	6				
				7				
				8				
			-8.4					
		Cone Refusal at 8.4 m Depth						

LOG OF BOREHOLE BH LOGS - 257522.GPJ TROW OTTAWA.GDT 1/10/20

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm diameter monitoring well installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00257522-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-2

Project No: OTT-00257522-A0

Project: Proposed Multi-Use Development

Location: 185 Preston Street, Ottawa, Ontario

Figure No. B-2

Page. 1 of 1

Date Drilled: 'December 18, 2019

Drill Type: Portable Drill

Datum: Depth Below Grade

Logged by: M.L. Checked by: S.P.

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)
Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Depth Below Grade m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		CONCRETE ~80 mm	0	0				
		GRANULAR FILL (BASE) ~180 mm	-0.1					
		SILTY SAND	-0.3					
		Brown, moist to wet, (loose to compact)		1	5	5	SS1	
					6	5	SS2	
				2	7	0	SS3	
				3	10	0	SS4	
				4	12	0	SS5	
		Borehole Terminated at 4.3 m Depth	-4.3					

Standard Penetration Test N Value: 20 40 60 80
Shear Strength kPa: 50 100 150 200
Combustible Vapour Reading (ppm): 250 500 750
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 20 40 60

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00257522-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS - 257522.GPJ TROW OTTAWA.GDT 1/10/20

Appendix D: Analytical Summary Tables

Table 1 - Analytical Results in Soil - Petroleum Hydrocarbons
185 Preston Street, Ottawa, Ontario
OTT-00257522-A0

Sample ID	MECP Table 3 SCS [1]	BH1-SS3	DUP (Field Duplicate of BH1-SS3)	BH1-SS8	BH2-SS1	BH2-SS5
Sampling Date		**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**
Sample Depth (mbgs)		**1.5 to 2.1**	**1.5 to 2.1**	**4.6 to 5.2**	**0.3 to 0.9**	**3.7 to 4.3**
Laboratory ID		**LPS354**	**LPS358**	**LPS355**	**LPS356**	**LPS357**
Date of Analysis		**23- & 24-Dec-19**	**23- & 24-Dec-19**	**23- & 24-Dec-19**	**23- & 24-Dec-19**	**23- & 24-Dec-19**
Laboratory Certificate of Analysis		**B9Z7785**	**B9Z7785**	**B9Z7785**	**B9Z7785**	**B9Z7785**
Benzene	0.21	<0.020	<0.020	<0.020	<0.020	<0.020
Toluene	2.3	<0.020	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	2	<0.020	<0.020	<0.020	<0.020	<0.020
Total Xylenes	3.1	<0.040	<0.040	<0.040	<0.040	<0.040
F1 (C6-C10) - BTEX*	55	<10	<10	<10	<10	<10
F2 (C10-C16)	98	<10	<10	<10	<10	<10
F3 (C16-C34)	300	<50	<50	<50	<50	<50
F4 (C34-C50)**	2800	<50	<50	<50	<50	<50

NOTES:

1	Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 3 Full Depth Generic Site Condition Standards (SCS) in a Non- Potable Ground Water Condition for Residential/Parkland/Institutional property use and coarse textured soils.
	All results are reported in ppm (ug/g) unless otherwise indicated.
*	F1 fraction does not include BTEX.
**	In instances where the PHC F2 to F4 chromatogram did not reach baseline, the F4 fraction result shown is the highest value obtained via the gas chromatograph/flame ionization detection method or the gravimetric method.
<(RDL)	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
N/A	Not Applicable
-	Parameter not analyzed
m bgs	Metres below ground surface
	Indicates soil exceedance of MECP Table 3 SCS

Table 2 - Analytical Results in Soil - Polycyclic Aromatic Hydrocarbons
185 Preston Street, Ottawa, Ontario
OTT-00257522-A0

Sample ID	MECP Table 3 SCS [1]	BH1-SS3	DUP (Field Duplicate of BH1-SS3)	BH1-SS8	BH2-SS1	BH2-SS5
Sampling Date		**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**
Sample Depth (mbgs)		**1.5 to 2.1**	**1.5 to 2.1**	**4.6 to 5.2**	**0.3 to 0.9**	**3.7 to 4.3**
Laboratory ID		**LPS354**	**LPS358**	**LPS355**	**LPS356**	**LPS357**
Date of Analysis		**23-Dec-2019**	**24-Dec-2019**	**23-Dec-2019**	**24-Dec-2019**	**24-Dec-2019**
Laboratory Certificate of Analysis		**B9Z7785**	**B9Z7785**	**B9Z7785**	**B9Z7785**	**B9Z7785**
Acenaphthene	7.9	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	0.15	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	0.67	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(a)anthracene	0.5	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(a)pyrene	0.3	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(b/j)fluoranthene	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(g,h,i)perylene	6.6	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(k)fluoranthene	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	7	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibenz(a,h)anthracene	0.1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	0.69	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluorene	62	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	0.38	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	0.99	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	0.99	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Methylnaphthalene, 2-(1-)	0.99	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071
Naphthalene	0.6	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	6.2	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Pyrene	78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

NOTES:

1	Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 3 Full Depth Generic Site Condition Standards (SCS) in a Non- Potable Ground Water Condition for Residential/Parkland/Institutional property use and coarse textured soils.
	All results are reported in ppm (ug/g) unless otherwise indicated.
<(RDL)	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
N/A	Not Applicable
-	Parameter not analyzed
m bgs	Metres below ground surface
	Indicates soil exceedance of MECP Table 3 SCS

Table 3 - Analytical Results in Soil - Inorganic Parameters
185 Preston Street, Ottawa, Ontario
OTT-00257522-A0

Sample ID	MECP Table 3 SCS [1]	BH1-SS3	DUP (Field Duplicate of BH1-SS3)	BH1-SS8	BH2-SS1	BH2-SS5
Sampling Date		**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**	**18-Dec-2019**
Sample Depth (mbgs)		**1.5 to 2.1**	**1.5 to 2.1**	**4.6 to 5.2**	**0.3 to 0.9**	**3.7 to 4.3**
Laboratory ID		**LPS354**	**LPS358**	**LPS355**	**LPS356**	**LPS357**
Date of Analysis		**24-Dec-2019**	**24-Dec-2019**	**24-Dec-2019**	**23- & 24-Dec-19**	**23- & 24-Dec-19**
Laboratory Certificate of Analysis		**B9Z7785**	**B9Z7785**	**B9Z7785**	**B9Z7785**	**B9Z7785**
Antimony	7.5	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	18	<1.0	<1.0	<1.0	<1.0	<1.0
Barium	390	51	49	15	65	22
Beryllium	4	0.22	0.22	<0.20	0.22	<0.20
Boron (Total)	120	5.5	5.1	<5.0	5.4	<5.0
Cadmium	1.2	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	160	11	11	4.6	9.9	6.5
Cobalt	22	9.9	19	2.3	5.4	8.4
Copper	140	9.2	8.1	1.3	7.9	14
Lead	120	3.3	3.6	1.8	3.6	2.3
Mercury	0.27	<0.050	<0.050	<0.050	<0.050	<0.050
Molybdenum	6.9	<0.50	<0.50	<0.50	<0.50	<0.50
Nickel	100	8.2	7.7	3.7	7.6	13
Selenium	2.4	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.096	0.071	<0.050	0.091	0.071
Uranium	23	0.52	0.52	0.34	0.53	0.77
Vanadium	86	23	24	8.8	21	15
Zinc	340	16	17	13	14	14
Cyanide	0.051	<0.01	<0.01	<0.01	<0.01	<0.01
pH (no units)	*	-	-	-	7.98	7.90

NOTES:

1	Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 3 Full Depth Generic Site Condition Standards (SCS) in a Non- Potable Ground Water Condition for Residential/Parkland/Institutional property use and coarse textured soils.
	All results are reported in ppm (ug/g) unless otherwise indicated.
*	Acceptable pH ranges are between 5.0 and 9.0 for soils at depths less than 1.5 metres below grade and between 5.0 and 11.0 for soils deeper than 1.5 metres below grade.
<(RDL)	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
N/A	Not Applicable
-	Parameter not analyzed
m bgs	Metres below ground surface
	Indicates soil exceedance of MECP Table 3 SCS

Table 4 - Relative Percent Differences - Petroleum Hydrocarbons in Soil
185 Preston Street, Ottawa, Ontario
OTT-00257522-A0

Parameter	Units	RDL	BH1-SS3	Dup	RPD (%)	Alert Limit (%)
			18-Dec-19	18-Dec-19		
Petroleum Hydrocarbons						
F1 PHCs (C6-C10) - BTEX	ug/g	10	<10	<10	nc	60
F2 PHCs (C10-C16)	ug/g	10	<10	<10	nc	60
F3 PHCs (C16-C34)	ug/g	50	<50	<50	nc	60
F4 PHCs (C34-C50)	ug/g	50	<50	<50	nc	60
Volatiles						
Benzene	ug/g	0.020	<0.020	<0.020	nc	100
Toluene	ug/g	0.020	<0.020	<0.020	nc	100
Ethylbenzene	ug/g	0.020	<0.020	<0.020	nc	100
Total Xylenes	ug/g	0.020	<0.040	<0.040	nc	100

NOTES:

Analysis by Bureau Veritas Laboratories
All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)
- means "not analysed"
nc means "not calculable" - one (or both) of the results are <5x RDL
Exceedances of alert limits are shown in **bold**

Table 5 - Relative Percent Differences - Polycyclic Aromatic Hydrocarbons in Soil
185 Preston Street, Ottawa, Ontario
OTT-00257522-A0

Parameter	Units	RDL	BH1-SS3	Dup	RPD (%)	Alert Limit (%)
			18-Dec-19	18-Dec-19		
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Acenaphthylene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Anthracene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(a)anthracene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(a)pyrene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(b/j)fluoranthene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(ghi)perylene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(k)fluoranthene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Chrysene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Dibenzo(a,h)anthracene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Fluoranthene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Fluorene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Indeno(1,2,3-cd)pyrene	ug/g	0.0050	<0.0050	<0.0050	nc	80
1-Methylnaphthalene	ug/g	0.0050	<0.0050	<0.0050	nc	80
2-Methylnaphthalene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Methylnaphthalene, 2-(1-)	ug/g	0.0071	<0.0071	<0.0071	nc	80
Naphthalene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Phenanthrene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Pyrene	ug/g	0.0050	<0.0050	<0.0050	nc	80

NOTES:

Analysis by Bureau Veritas Laboratories

All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Table 6 - Relative Percent Differences - Inorganic Parameters in Soil
185 Preston Street, Ottawa, Ontario
OTT-00257522-A0

Parameter	Units	RDL	BH1-SS3	Dup	RPD (%)	Alert Limit (%)
			18-Dec-19	18-Dec-19		
Inorganic Parameters						
Antimony	ug/g	0.20	<0.20	<0.20	nc	60
Arsenic	ug/g	1.0	<1.0	<1.0	nc	60
Barium	ug/g	0.50	51	49	4	60
Beryllium	ug/g	0.20	0.22	0.22	nc	60
Boron	ug/g	5.0	5.5	5.1	nc	60
Cadmium	ug/g	0.10	<0.10	<0.10	nc	60
Chromium	ug/g	1.0	11	11	0	60
Cobalt	ug/g	0.10	9.9	19	**63**	60
Copper	ug/g	0.50	9.2	8.1	13	60
Lead	ug/g	1.0	3.3	3.6	nc	60
Mercury	ug/g	0.050	<0.050	<0.050	nc	60
Molybdenum	ug/g	0.50	<0.50	<0.50	nc	60
Nickel	ug/g	0.50	8.2	7.7	6	60
Selenium	ug/g	0.50	<0.50	<0.50	nc	60
Silver	ug/g	0.20	<0.20	<0.20	nc	60
Thallium	ug/g	0.050	0.096	0.071	nc	60
Uranium	ug/g	0.050	0.52	0.52	0	60
Vanadium	ug/g	5.0	23	24	nc	60
Zinc	ug/g	5.0	16	17	nc	60
Cyanide	ug/g	0.01	<0.01	<0.01	nc	60

NOTES:

Analysis by Bureau Veritas Laboratories
All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)
- means "not analysed"
nc means "not calculable" - one (or both) of the results are <5x RDL
Exceedances of alert limits are shown in **bold**

Appendix E: Laboratory Certificates of Analysis

Your Project #: OTT-00257522-A0
Your C.O.C. #: 751794-01-01

Attention: Patricia Stelmack

exp Services Inc
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2019/12/27
Report #: R6021297
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9Z7785
Received: 2019/12/19, 11:00

Sample Matrix: Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	5	N/A	2019/12/27	CAM SOP-00301	EPA 8270D m
Free (WAD) Cyanide (1)	5	2019/12/20	2019/12/24	CAM SOP-00457	OMOE E3015 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	5	N/A	2019/12/23	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	5	2019/12/23	2019/12/24	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS (1)	5	2019/12/23	2019/12/24	CAM SOP-00447	EPA 6020B m
Moisture (1)	5	N/A	2019/12/20	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	2	2019/12/23	2019/12/23	CAM SOP-00318	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM) (1)	3	2019/12/23	2019/12/24	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT (1)	2	2019/12/23	2019/12/23	CAM SOP-00413	EPA 9045 D m
Sieve, 75um (1)	1	N/A	2019/12/23	CAM SOP-00467	ASTM D1140 -17 m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Laboratories Mississauga
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed

Your Project #: OTT-00257522-A0
Your C.O.C. #: 751794-01-01

Attention: Patricia Stelmack

exp Services Inc
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2019/12/27
Report #: R6021297
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9Z7785
Received: 2019/12/19, 11:00

elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Alisha Williamson
Project Manager
27 Dec 2019 17:26:13

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alisha Williamson, Project Manager
Email: Alisha.Williamson@bvlabs.com
Phone# (613)274-0573

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: B9Z7785
Report Date: 2019/12/27

exp Services Inc
Client Project #: OTT-00257522-A0
Sampler Initials: ML

O.REG 153 ICPMS METALS (SOIL)

BV Labs ID		LPS354	LPS355	LPS356	LPS357	LPS358		
Sampling Date		2019/12/18 10:00	2019/12/18 12:00	2019/12/18 14:00	2019/12/18 15:30	2019/12/18 10:00		
COC Number		751794-01-01	751794-01-01	751794-01-01	751794-01-01	751794-01-01		
	UNITS	**BH1-SS3**	**BH1-SS8**	**BH2-SS1**	**BH2-SS5**	**DUP**	**RDL**	**QC Batch**
Metals								
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6511559
Acid Extractable Arsenic (As)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6511559
Acid Extractable Barium (Ba)	ug/g	51	15	65	22	49	0.50	6511559
Acid Extractable Beryllium (Be)	ug/g	0.22	<0.20	0.22	<0.20	0.22	0.20	6511559
Acid Extractable Boron (B)	ug/g	5.5	<5.0	5.4	<5.0	5.1	5.0	6511559
Acid Extractable Cadmium (Cd)	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6511559
Acid Extractable Chromium (Cr)	ug/g	11	4.6	9.9	6.5	11	1.0	6511559
Acid Extractable Cobalt (Co)	ug/g	9.9	2.3	5.4	8.4	19	0.10	6511559
Acid Extractable Copper (Cu)	ug/g	9.2	1.3	7.9	14	8.1	0.50	6511559
Acid Extractable Lead (Pb)	ug/g	3.3	1.8	3.6	2.3	3.6	1.0	6511559
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6511559
Acid Extractable Nickel (Ni)	ug/g	8.2	3.7	7.6	13	7.7	0.50	6511559
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6511559
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6511559
Acid Extractable Thallium (Tl)	ug/g	0.096	<0.050	0.091	0.071	0.071	0.050	6511559
Acid Extractable Uranium (U)	ug/g	0.52	0.34	0.53	0.77	0.52	0.050	6511559
Acid Extractable Vanadium (V)	ug/g	23	8.8	21	15	24	5.0	6511559
Acid Extractable Zinc (Zn)	ug/g	16	13	14	14	17	5.0	6511559
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	6511559

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 PAHS (SOIL)

BV Labs ID		LPS354	LPS355			LPS355		
Sampling Date		2019/12/18 10:00	2019/12/18 12:00			2019/12/18 12:00		
COC Number		751794-01-01	751794-01-01			751794-01-01		
	UNITS	**BH1-SS3**	**BH1-SS8**	**RDL**	**QC Batch**	**BH1-SS8 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters								
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	0.0071	6506001			
Polyaromatic Hydrocarbons								
Acenaphthene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Acenaphthylene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Anthracene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Chrysene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Dibenzo(a,h)anthracene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Fluoranthene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Fluorene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Naphthalene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Phenanthrene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Pyrene	ug/g	<0.0050	<0.0050	0.0050	6512261	<0.0050	0.0050	6512261
Surrogate Recovery (%)								
D10-Anthracene	%	98	92		6512261	99		6512261
D14-Terphenyl (FS)	%	102	96		6512261	102		6512261
D8-Acenaphthylene	%	85	70		6512261	73		6512261

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 PAHS (SOIL)

BV Labs ID		LPS356	LPS357	LPS358		
Sampling Date		2019/12/18 14:00	2019/12/18 15:30	2019/12/18 10:00		
COC Number		751794-01-01	751794-01-01	751794-01-01		
	UNITS	**BH2-SS1**	**BH2-SS5**	**DUP**	**RDL**	**QC Batch**
Calculated Parameters						
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	<0.0071	0.0071	6506001
Polyaromatic Hydrocarbons						
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Dibenzo(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	6512261
Surrogate Recovery (%)						
D10-Anthracene	%	97	99	101		6512261
D14-Terphenyl (FS)	%	100	100	102		6512261
D8-Acenaphthylene	%	82	78	88		6512261

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 PHCS, BTEX/F1-F4 (SOIL)

BV Labs ID		LPS354	LPS355			LPS355			LPS356		
Sampling Date		2019/12/18 10:00	2019/12/18 12:00			2019/12/18 12:00			2019/12/18 14:00		
COC Number		751794-01-01	751794-01-01			751794-01-01			751794-01-01		
	UNITS	**BH1-SS3**	**BH1-SS8**	**RDL**	**QC Batch**	**BH1-SS8 Lab-Dup**	**RDL**	**QC Batch**	**BH2-SS1**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	10	18	1.0	6510144				9.4	1.0	6510144
BTEX & F1 Hydrocarbons											
Benzene	ug/g	<0.020	<0.020	0.020	6510961				<0.020	0.020	6510961
Toluene	ug/g	<0.020	<0.020	0.020	6510961				<0.020	0.020	6510961
Ethylbenzene	ug/g	<0.020	<0.020	0.020	6510961				<0.020	0.020	6510961
o-Xylene	ug/g	<0.020	<0.020	0.020	6510961				<0.020	0.020	6510961
p+m-Xylene	ug/g	<0.040	<0.040	0.040	6510961				<0.040	0.040	6510961
Total Xylenes	ug/g	<0.040	<0.040	0.040	6510961				<0.040	0.040	6510961
F1 (C6-C10)	ug/g	<10	<10	10	6510961				<10	10	6510961
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	6510961				<10	10	6510961
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	10	6512202	<10	10	6512202	<10	10	6512202
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	50	6512202	<50	50	6512202	<50	50	6512202
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	50	6512202	<50	50	6512202	<50	50	6512202
Reached Baseline at C50	ug/g	Yes	Yes		6512202	Yes		6512202	Yes		6512202
Surrogate Recovery (%)											
1,4-Difluorobenzene	%	100	100		6510961				101		6510961
4-Bromofluorobenzene	%	95	95		6510961				97		6510961
D10-Ethylbenzene	%	99	101		6510961				121		6510961
D4-1,2-Dichloroethane	%	104	106		6510961				105		6510961
o-Terphenyl	%	88	91		6512202	88		6512202	86		6512202

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 PHCS, BTEX/F1-F4 (SOIL)

BV Labs ID		LPS357	LPS358		
Sampling Date		2019/12/18 15:30	2019/12/18 10:00		
COC Number		751794-01-01	751794-01-01		
	UNITS	**BH2-SS5**	**DUP**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	3.7	9.2	1.0	6510144
BTEX & F1 Hydrocarbons					
Benzene	ug/g	<0.020	<0.020	0.020	6510961
Toluene	ug/g	<0.020	<0.020	0.020	6510961
Ethylbenzene	ug/g	<0.020	<0.020	0.020	6510961
o-Xylene	ug/g	<0.020	<0.020	0.020	6510961
p+m-Xylene	ug/g	<0.040	<0.040	0.040	6510961
Total Xylenes	ug/g	<0.040	<0.040	0.040	6510961
F1 (C6-C10)	ug/g	<10	<10	10	6510961
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	6510961
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	10	6512202
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	50	6512202
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	50	6512202
Reached Baseline at C50	ug/g	Yes	Yes		6512202
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	99	100		6510961
4-Bromofluorobenzene	%	95	95		6510961
D10-Ethylbenzene	%	87	97		6510961
D4-1,2-Dichloroethane	%	106	105		6510961
o-Terphenyl	%	84	87		6512202

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

BV Labs Job #: B9Z7785
Report Date: 2019/12/27

exp Services Inc
Client Project #: OTT-00257522-A0
Sampler Initials: ML

RESULTS OF ANALYSES OF SOIL

BV Labs ID		LPS353			LPS354	LPS355		LPS356		
Sampling Date		2019/12/18 11:30			2019/12/18 10:00	2019/12/18 12:00		2019/12/18 14:00		
COC Number		751794-01-01			751794-01-01	751794-01-01		751794-01-01		
	UNITS	**BH1-SS7**	**RDL**	**QC Batch**	**BH1-SS3**	**BH1-SS8**	**QC Batch**	**BH2-SS1**	**RDL**	**QC Batch**
Inorganics										
Available (CaCl2) pH	pH							7.98		6511817
WAD Cyanide (Free)	ug/g				<0.01	<0.01	6509602	<0.01	0.01	6509602
Miscellaneous Parameters										
Grain Size	%	COARSE	N/A	6511069						
Sieve - #200 (<0.075mm)	%	2	1	6511069						
Sieve - #200 (>0.075mm)	%	98	1	6511069						

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

BV Labs ID		LPS357			LPS357		LPS358		
Sampling Date		2019/12/18 15:30			2019/12/18 15:30		2019/12/18 10:00		
COC Number		751794-01-01			751794-01-01		751794-01-01		
	UNITS	**BH2-SS5**	**RDL**	**QC Batch**	**BH2-SS5 Lab-Dup**	**QC Batch**	**DUP**	**RDL**	**QC Batch**
Inorganics									
Available (CaCl2) pH	pH	7.90		6511817	8.02	6511817			
WAD Cyanide (Free)	ug/g	<0.01	0.01	6509602			<0.01	0.01	6509602

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

TEST SUMMARY

BV Labs ID: LPS353 **Collected:** 2019/12/18
Sample ID: BH1-SS7 **Shipped:**
Matrix: Soil **Received:** 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sieve, 75um	SIEV	6511069	N/A	2019/12/23	Prgya Panchal

BV Labs ID: LPS354 **Collected:** 2019/12/18
Sample ID: BH1-SS3 **Shipped:**
Matrix: Soil **Received:** 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6506001	N/A	2019/12/27	Automated Statchk
Free (WAD) Cyanide	TECH	6509602	2019/12/20	2019/12/24	Louise Harding
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6510961	N/A	2019/12/23	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6512202	2019/12/23	2019/12/24	Prabhjot Gulati
Strong Acid Leachable Metals by ICPMS	ICP/MS	6511559	2019/12/23	2019/12/24	Daniel Teclu
Moisture	BAL	6510144	N/A	2019/12/20	Kruti Jitesh Patel
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6512261	2019/12/23	2019/12/23	Mitesh Raj

BV Labs ID: LPS355 **Collected:** 2019/12/18
Sample ID: BH1-SS8 **Shipped:**
Matrix: Soil **Received:** 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6506001	N/A	2019/12/27	Automated Statchk
Free (WAD) Cyanide	TECH	6509602	2019/12/20	2019/12/24	Louise Harding
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6510961	N/A	2019/12/23	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6512202	2019/12/23	2019/12/24	Prabhjot Gulati
Strong Acid Leachable Metals by ICPMS	ICP/MS	6511559	2019/12/23	2019/12/24	Daniel Teclu
Moisture	BAL	6510144	N/A	2019/12/20	Kruti Jitesh Patel
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6512261	2019/12/23	2019/12/23	Mitesh Raj

BV Labs ID: LPS355 Dup **Collected:** 2019/12/18
Sample ID: BH1-SS8 **Shipped:**
Matrix: Soil **Received:** 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6512202	2019/12/23	2019/12/24	Prabhjot Gulati
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6512261	2019/12/23	2019/12/23	Mitesh Raj

BV Labs ID: LPS356 **Collected:** 2019/12/18
Sample ID: BH2-SS1 **Shipped:**
Matrix: Soil **Received:** 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6506001	N/A	2019/12/27	Automated Statchk
Free (WAD) Cyanide	TECH	6509602	2019/12/20	2019/12/24	Louise Harding
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6510961	N/A	2019/12/23	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6512202	2019/12/23	2019/12/24	Prabhjot Gulati
Strong Acid Leachable Metals by ICPMS	ICP/MS	6511559	2019/12/23	2019/12/24	Daniel Teclu
Moisture	BAL	6510144	N/A	2019/12/20	Kruti Jitesh Patel

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

TEST SUMMARY

BV Labs ID: LPS356
Sample ID: BH2-SS1
Matrix: Soil

Collected: 2019/12/18
Shipped:
Received: 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6512261	2019/12/23	2019/12/24	Mitesh Raj
pH CaCl2 EXTRACT	AT	6511817	2019/12/23	2019/12/23	Surinder Rai

BV Labs ID: LPS357
Sample ID: BH2-SS5
Matrix: Soil

Collected: 2019/12/18
Shipped:
Received: 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6506001	N/A	2019/12/27	Automated Statchk
Free (WAD) Cyanide	TECH	6509602	2019/12/20	2019/12/24	Louise Harding
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6510961	N/A	2019/12/23	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6512202	2019/12/23	2019/12/24	Prabhjot Gulati
Strong Acid Leachable Metals by ICPMS	ICP/MS	6511559	2019/12/23	2019/12/24	Daniel Teclu
Moisture	BAL	6510144	N/A	2019/12/20	Kruti Jitesh Patel
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6512261	2019/12/23	2019/12/24	Mitesh Raj
pH CaCl2 EXTRACT	AT	6511817	2019/12/23	2019/12/23	Surinder Rai

BV Labs ID: LPS357 Dup
Sample ID: BH2-SS5
Matrix: Soil

Collected: 2019/12/18
Shipped:
Received: 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	6511817	2019/12/23	2019/12/23	Surinder Rai

BV Labs ID: LPS358
Sample ID: DUP
Matrix: Soil

Collected: 2019/12/18
Shipped:
Received: 2019/12/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6506001	N/A	2019/12/27	Automated Statchk
Free (WAD) Cyanide	TECH	6509602	2019/12/20	2019/12/24	Louise Harding
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6510961	N/A	2019/12/23	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6512202	2019/12/23	2019/12/24	Prabhjot Gulati
Strong Acid Leachable Metals by ICPMS	ICP/MS	6511559	2019/12/23	2019/12/24	Daniel Teclu
Moisture	BAL	6510144	N/A	2019/12/20	Kruti Jitesh Patel
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6512261	2019/12/23	2019/12/24	Mitesh Raj

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

BV Labs Job #: B9Z7785
Report Date: 2019/12/27

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: OTT-00257522-A0
Sampler Initials: ML

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6510961	1,4-Difluorobenzene	2019/12/23	99	60 - 140	100	60 - 140	101	%				
6510961	4-Bromofluorobenzene	2019/12/23	96	60 - 140	98	60 - 140	94	%				
6510961	D10-Ethylbenzene	2019/12/23	97	60 - 140	85	60 - 140	89	%				
6510961	D4-1,2-Dichloroethane	2019/12/23	105	60 - 140	105	60 - 140	104	%				
6512202	o-Terphenyl	2019/12/24	97	60 - 130	96	60 - 130	86	%				
6512261	D10-Anthracene	2019/12/23	98	50 - 130	99	50 - 130	100	%				
6512261	D14-Terphenyl (FS)	2019/12/23	100	50 - 130	103	50 - 130	101	%				
6512261	D8-Acenaphthylene	2019/12/23	82	50 - 130	95	50 - 130	92	%				
6509602	WAD Cyanide (Free)	2019/12/24	72 (1)	75 - 125	98	80 - 120	<0.01	ug/g	NC	35		
6510144	Moisture	2019/12/20							1.4	20		
6510961	Benzene	2019/12/23	99	60 - 140	96	60 - 140	<0.020	ug/g	NC	50		
6510961	Ethylbenzene	2019/12/23	101	60 - 140	98	60 - 140	<0.020	ug/g	NC	50		
6510961	F1 (C6-C10) - BTEX	2019/12/23					<10	ug/g	NC	30		
6510961	F1 (C6-C10)	2019/12/23	76	60 - 140	82	80 - 120	<10	ug/g	NC	30		
6510961	o-Xylene	2019/12/23	98	60 - 140	95	60 - 140	<0.020	ug/g	NC	50		
6510961	p+m-Xylene	2019/12/23	98	60 - 140	96	60 - 140	<0.040	ug/g	NC	50		
6510961	Toluene	2019/12/23	95	60 - 140	94	60 - 140	<0.020	ug/g	NC	50		
6510961	Total Xylenes	2019/12/23					<0.040	ug/g	NC	50		
6511069	Sieve - #200 (<0.075mm)	2019/12/23							1.3	20	56	53 - 58
6511069	Sieve - #200 (>0.075mm)	2019/12/23							2.6	20	44	42 - 47
6511559	Acid Extractable Antimony (Sb)	2019/12/24	96	75 - 125	98	80 - 120	<0.20	ug/g				
6511559	Acid Extractable Arsenic (As)	2019/12/24	94	75 - 125	101	80 - 120	<1.0	ug/g				
6511559	Acid Extractable Barium (Ba)	2019/12/24	NC	75 - 125	90	80 - 120	<0.50	ug/g				
6511559	Acid Extractable Beryllium (Be)	2019/12/24	95	75 - 125	99	80 - 120	<0.20	ug/g				
6511559	Acid Extractable Boron (B)	2019/12/24	95	75 - 125	96	80 - 120	<5.0	ug/g				
6511559	Acid Extractable Cadmium (Cd)	2019/12/24	93	75 - 125	98	80 - 120	<0.10	ug/g				
6511559	Acid Extractable Chromium (Cr)	2019/12/24	94	75 - 125	99	80 - 120	<1.0	ug/g				
6511559	Acid Extractable Cobalt (Co)	2019/12/24	91	75 - 125	99	80 - 120	<0.10	ug/g				
6511559	Acid Extractable Copper (Cu)	2019/12/24	94	75 - 125	100	80 - 120	<0.50	ug/g				
6511559	Acid Extractable Lead (Pb)	2019/12/24	91	75 - 125	100	80 - 120	<1.0	ug/g	2.5	30		
6511559	Acid Extractable Mercury (Hg)	2019/12/24	84	75 - 125	95	80 - 120	<0.050	ug/g				
6511559	Acid Extractable Molybdenum (Mo)	2019/12/24	95	75 - 125	98	80 - 120	<0.50	ug/g				

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6511559	Acid Extractable Nickel (Ni)	2019/12/24	93	75 - 125	98	80 - 120	<0.50	ug/g				
6511559	Acid Extractable Selenium (Se)	2019/12/24	97	75 - 125	104	80 - 120	<0.50	ug/g				
6511559	Acid Extractable Silver (Ag)	2019/12/24	96	75 - 125	100	80 - 120	<0.20	ug/g				
6511559	Acid Extractable Thallium (Tl)	2019/12/24	90	75 - 125	100	80 - 120	<0.050	ug/g				
6511559	Acid Extractable Uranium (U)	2019/12/24	90	75 - 125	98	80 - 120	<0.050	ug/g				
6511559	Acid Extractable Vanadium (V)	2019/12/24	97	75 - 125	101	80 - 120	<5.0	ug/g				
6511559	Acid Extractable Zinc (Zn)	2019/12/24	95	75 - 125	99	80 - 120	<5.0	ug/g				
6511817	Available (CaCl2) pH	2019/12/23			100	97 - 103			1.5	N/A		
6512202	F2 (C10-C16 Hydrocarbons)	2019/12/24	106	50 - 130	106	80 - 120	<10	ug/g	NC	30		
6512202	F3 (C16-C34 Hydrocarbons)	2019/12/24	110	50 - 130	106	80 - 120	<50	ug/g	NC	30		
6512202	F4 (C34-C50 Hydrocarbons)	2019/12/24	108	50 - 130	106	80 - 120	<50	ug/g	NC	30		
6512261	1-Methylnaphthalene	2019/12/23	77	50 - 130	103	50 - 130	<0.0050	ug/g	NC	40		
6512261	2-Methylnaphthalene	2019/12/23	69	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40		
6512261	Acenaphthene	2019/12/23	88	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40		
6512261	Acenaphthylene	2019/12/23	81	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40		
6512261	Anthracene	2019/12/23	93	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40		
6512261	Benzo(a)anthracene	2019/12/23	102	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40		
6512261	Benzo(a)pyrene	2019/12/23	100	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40		
6512261	Benzo(b/j)fluoranthene	2019/12/23	96	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40		
6512261	Benzo(g,h,i)perylene	2019/12/23	96	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40		
6512261	Benzo(k)fluoranthene	2019/12/23	94	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40		
6512261	Chrysene	2019/12/23	96	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40		
6512261	Dibenzo(a,h)anthracene	2019/12/23	112	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40		
6512261	Fluoranthene	2019/12/23	98	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40		
6512261	Fluorene	2019/12/23	89	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40		
6512261	Indeno(1,2,3-cd)pyrene	2019/12/23	100	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40		
6512261	Naphthalene	2019/12/23	55	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40		
6512261	Phenanthrene	2019/12/23	93	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6512261	Pyrene	2019/12/23	97	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

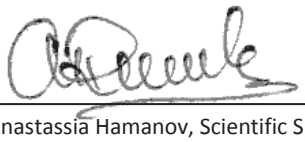
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Scientific Specialist

Brad Newman, Scientific Service Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvlabs.com

Page of

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#30854 exp Services Inc	Company Name:		Quotation #:	B91717	BV Labs Job #:	Bottle Order #: 751794
Attention:	Accounts Payable	Attention:	Patricia Stelmack	P.O. #:			
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-00257522-A0		
				Project Name:		COC #: C#751794-01-01	Project Manager: Alisha Williamson
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Site #:			
Email:	accounting.ottawa@exp.com; Karen.Burke@exp.com;	Email:	patricia.stelmack@exp.com	Sampled By:	ML		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☒ Table 3 ☐ Agri/Other ☐ For RSC; ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558. ☐ Storm Sewer Bylaw; ☐ MISA Municipality ___; ☐ PWQO; ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 PHCs, BTEX/F1-F4 (Soil)	O.Reg 153 ICPMS Metals & Free Cyanide + Hg	O.Reg 153 PAHs (Soil)	pH CaCl2 EXTRACT	Sieve, 75um	# of Bottles	Comments
1		BH1-SS7	18-Dec-19	11:30	Soil						X	1	
2		BH1-SS3	↓	10:00	↓		X	X	X			4	
3		BH1-SS8		12:00			X	X	X			4	
4		BH2-SS1		14:00			X	X	X	X		4	
5		BH2-SS5		15:30			X	X	X	X		4	
6		DUP	↓	10:00	↓		X	X	X			4	
7													
8													
9													
10													

19-Dec-19 11:00
Alisha Williamson
B9Z7785
KJY OTT-001

on ice

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
P. Stelmack	19/12/19	10:30	Serge Leger	19/12/19	11:00	

Laboratory Use Only
Time Sensitive | Temperature (°C) on Recei: 0.1.1 | Custody Seal: Present ☒, Intact ☒ (Yes / No)

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvlabs.com

Page of

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#30854 exp Services Inc	Company Name:		Quotation #:	B91717	BV Labs Job #:	Bottle Order #: 751794
Attention:	Accounts Payable	Attention:	Patricia Stelmack	P.O. #:			
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-00257522-A0	COC #: C#751794-01-01	Project Manager: Alisha Williamson
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:			
Email:	accounting.ottawa@exp.com; Karen.Burke@exp.com;	Email:	patricia.stelmack@exp.com	Site #:			
				Sampled By:	ML		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☒ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☒ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	O.Reg 153 PHCs, BTEX/F1-F4 (Soil)	O.Reg 153 ICPMS Metals & Free Cyanide + Hg	O.Reg 153 PAHs (Soil)	pH CaCl2 EXTRACT	Sieve, 75um	# of Bottles	Comments
1		BH1-SS7	18-Dec-19	11:30	Soil					X	1	
2		BH1-SS3	↓	10:00	↓	X	X	X			4	
3		BH1-SS8		12:00		X	X	X			4	
4		BH2-SS1		14:00		X	X	X	X		4	
5		BH2-SS5		15:30		X	X	X	X		4	
6		DUP	↓	10:00	↓	X	X	X			4	
7												
8												
9												
10												

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___
(call lab for #)

19-Dec-19 11:00
Alisha Williamson
B9Z7785
KJY OTT-001

on ice

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
P. Stelmack / P Stelmack	19/12/19	10:30	[illegible]	19/12/19	11:00	
			[illegible]	2019/12/20	08:00	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	0.1.1	Present	X	
		Intact	X	

RECEIVED IN OTTAWA

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

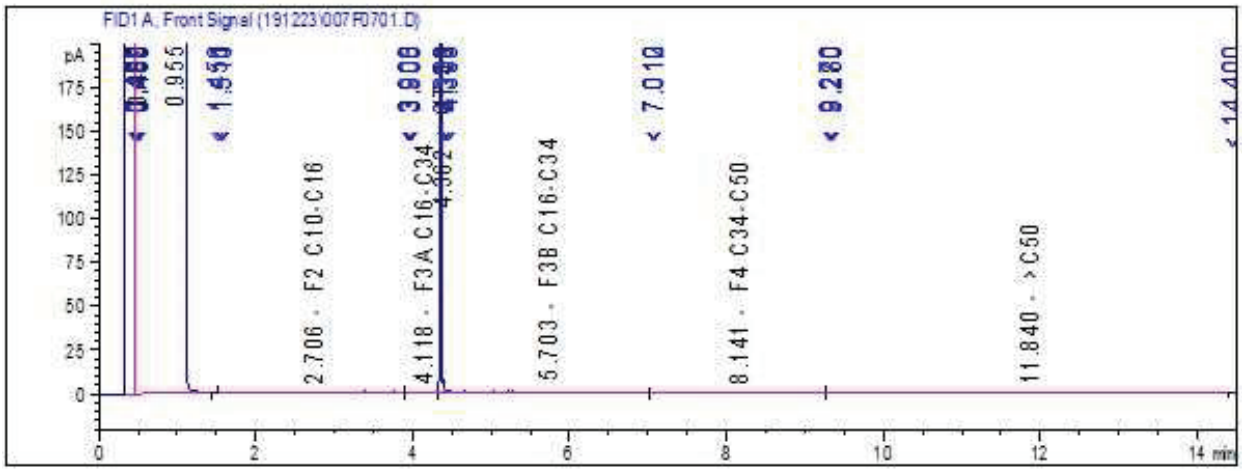
7.7.7

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

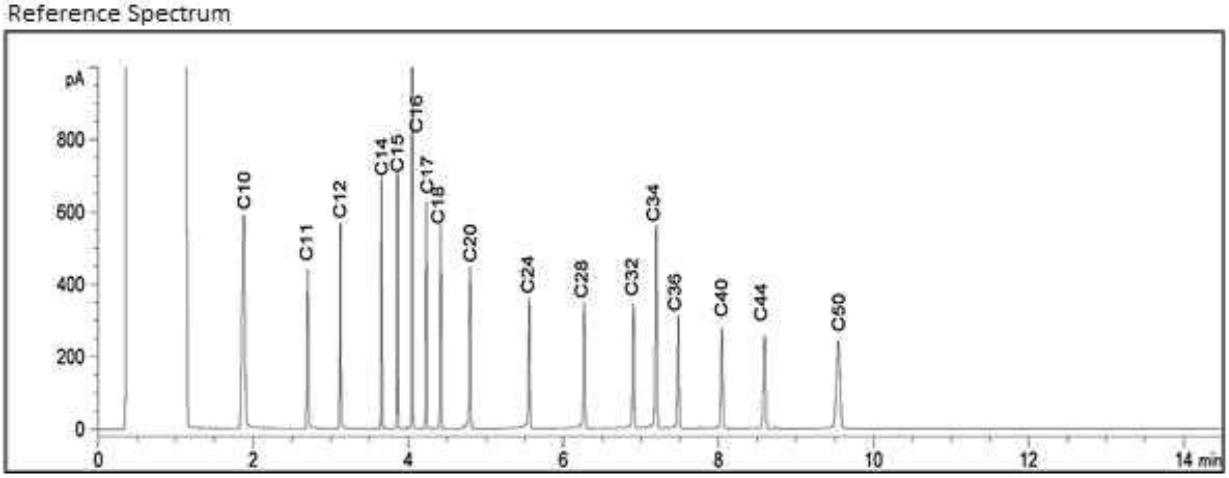
White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

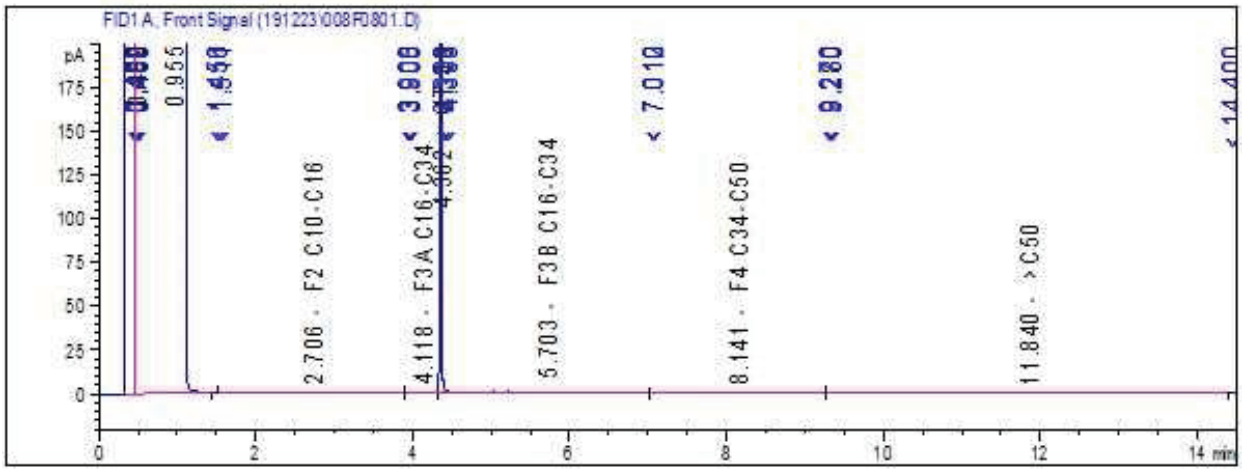
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

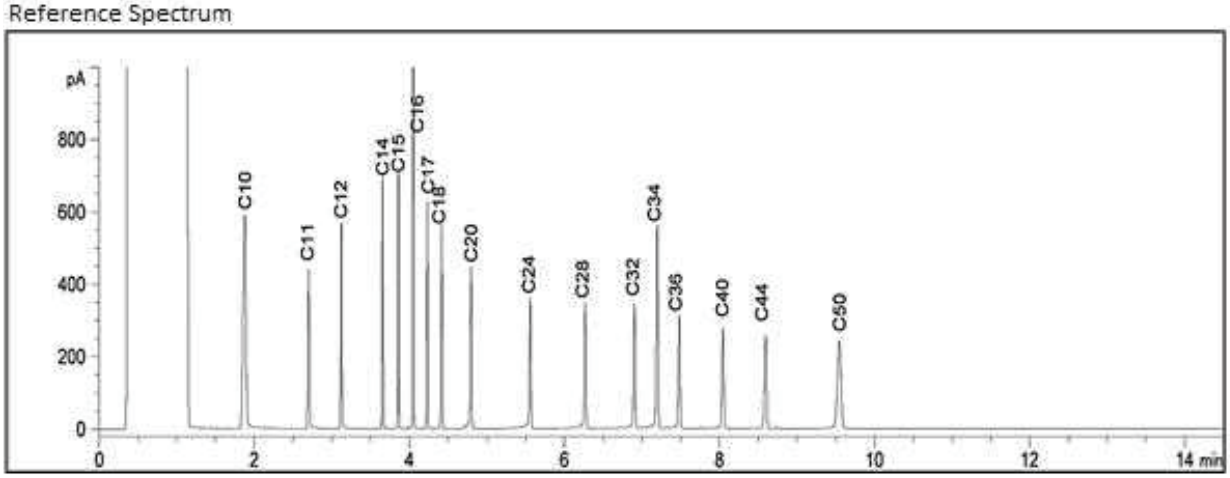
BV Labs Job #: B9Z7785
Report Date: 2019/12/27
BV Labs Sample: LPS355

exp Services Inc
Client Project #: OTT-00257522-A0
Client ID: BH1-SS8

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

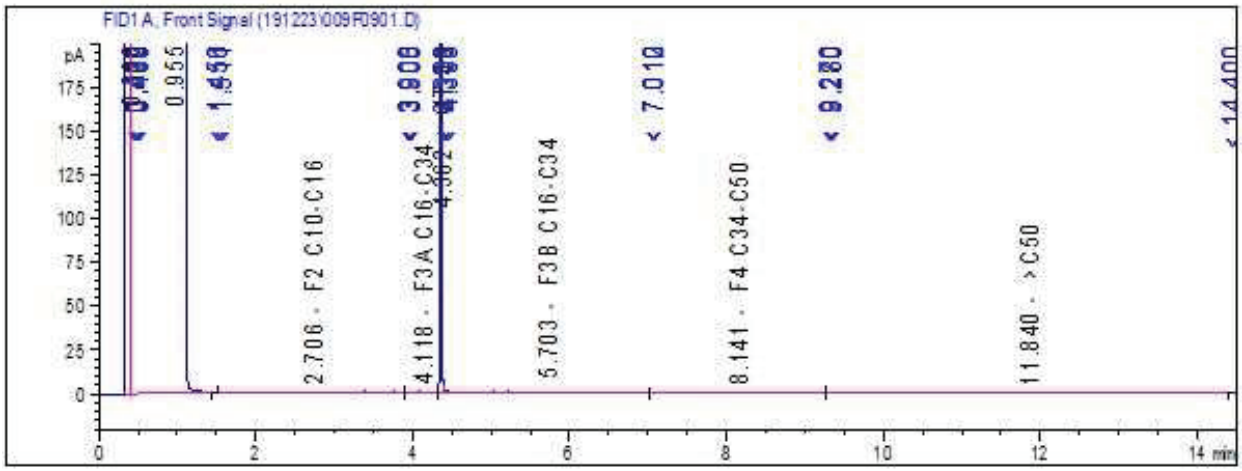
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

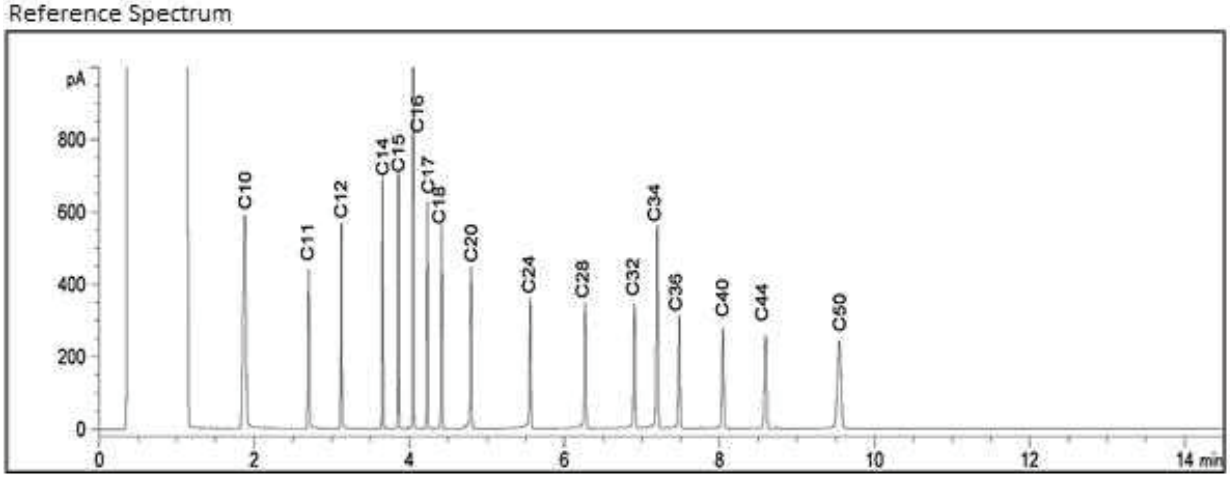
BV Labs Job #: B9Z7785
Report Date: 2019/12/27
BV Labs Sample: LPS355 Lab-Dup

exp Services Inc
Client Project #: OTT-00257522-A0
Client ID: BH1-SS8

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

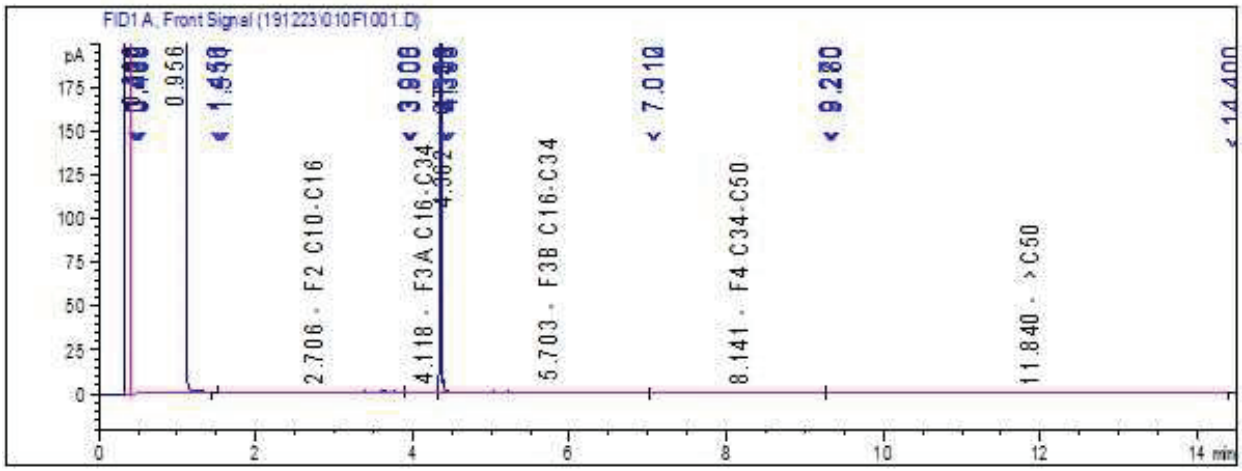
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

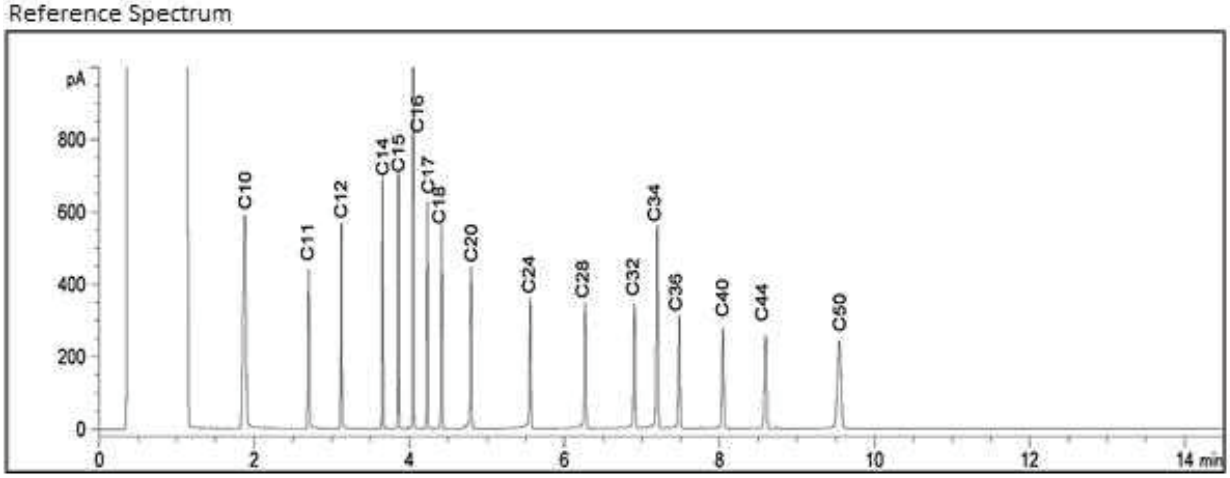
BV Labs Job #: B9Z7785
Report Date: 2019/12/27
BV Labs Sample: LPS356

exp Services Inc
Client Project #: OTT-00257522-A0
Client ID: BH2-SS1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

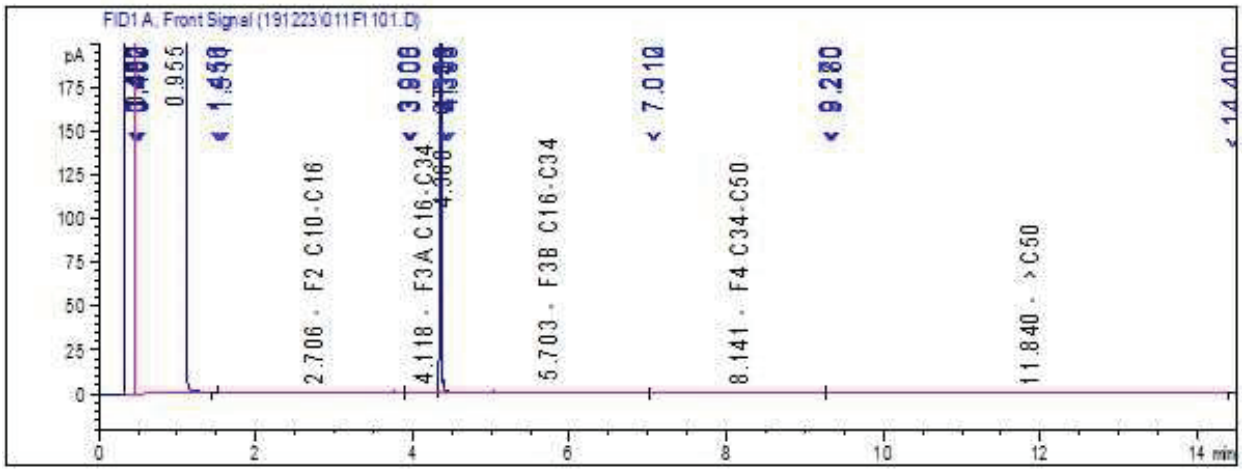
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

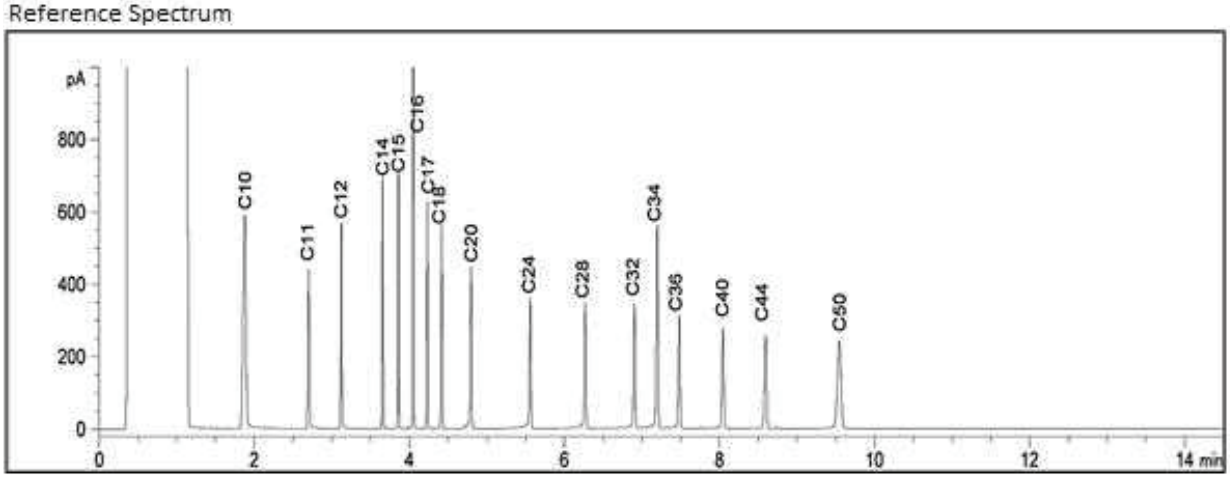
BV Labs Job #: B9Z7785
Report Date: 2019/12/27
BV Labs Sample: LPS357

exp Services Inc
Client Project #: OTT-00257522-A0
Client ID: BH2-SS5

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

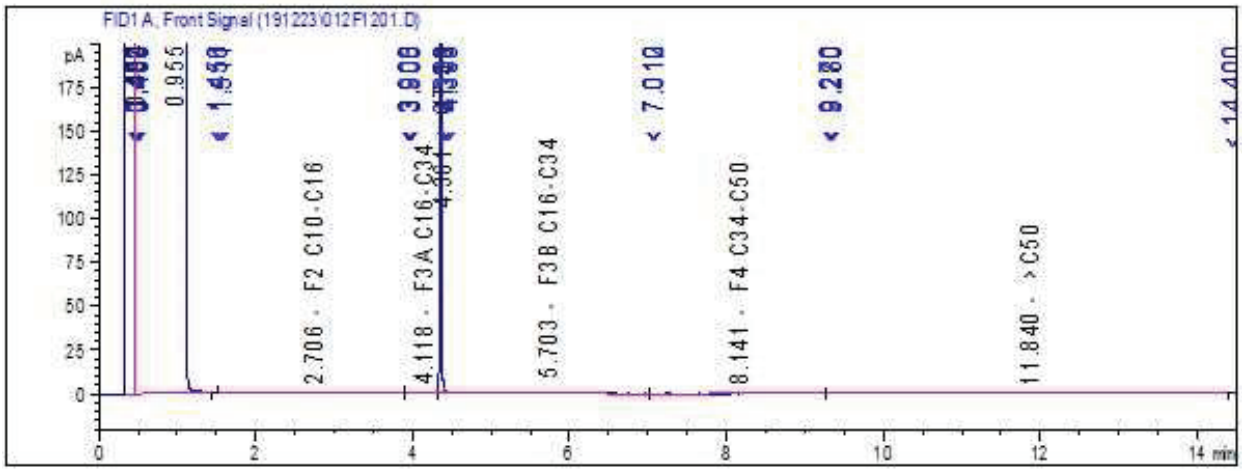
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

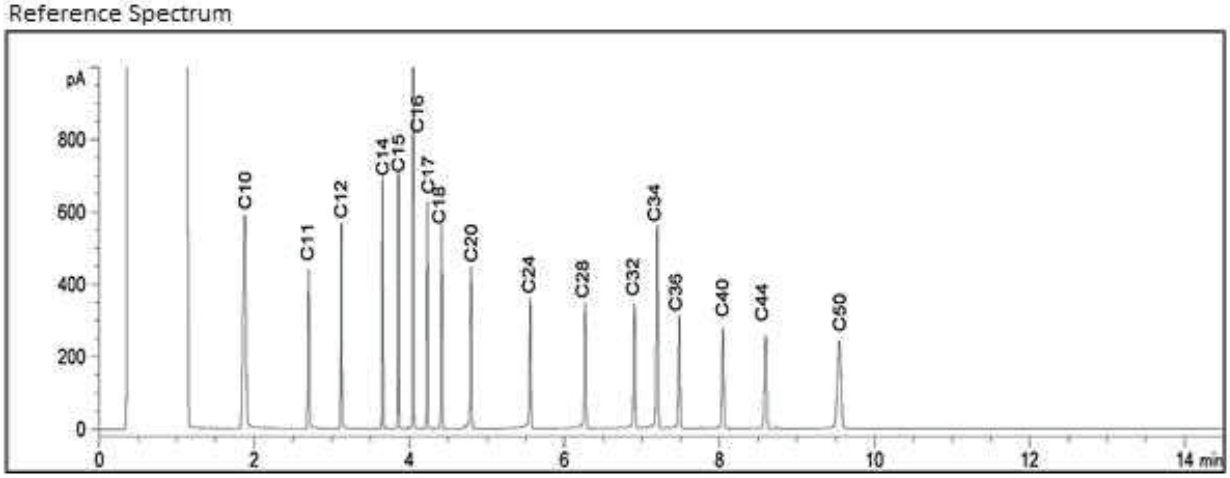
BV Labs Job #: B9Z7785
Report Date: 2019/12/27
BV Labs Sample: LPS358

exp Services Inc
Client Project #: OTT-00257522-A0
Client ID: DUP

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.